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REMARKS ON THE CASTRATION OF CRYPTORCHID HORSES, AND ON HÆMORRHAGE AFTER ORDINARY CASTRATION.

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I PERUSED with much interest the article by Mr. Lyford (in the August number of the VETERINARY JOURNAL) on the castration of cryptorchid horses. It is quite true, as Mr. Lyford asserts, that little notice has been taken of this operation by British veterinary surgeons; and I assume that this want of interest on our part has arisen largely from the fact that the number of cryptorchids in Great Britain is comparatively small, and that as a rule these animals are isolated and worked with geldings In America—as I was informed a short time ago by Mr. Miles—cryptorchids are numerous, this being attributed by that gentleman to the fact that the abnormality is hereditary, and that at one time breeders employed cryptorchids largely for stock purposes.

I must candidly confess that I have not operated upon a cryptorchid, as occasion for doing so in my practice has never arisen; but in thinking over the matter, I came to the conclusion in my own mind that the operation must be performed—in the case of intra-abdominal cryptorchids—either by passing the hand through the inguinal canal and internal ring, or by cutting directly into the abdomen; and, the opportunity occurring, I, in

the presence of my colleagues, asked Farmer Miles which method he adopted. The rejoinder was characteristic, being, "Ah! that's the secret." Mr. Lyford's remarks confirm my ideas of the operation. Another thing occurred to me, viz., that in a large percentage of cases the testicle is lodged in the inguinal canal; in this surmise I was also correct. As to casting and securing, I do not see that Mr. Miles' plan, except in certain peculiarities in his ropes, differs from our own. I opine that all veterinary surgeons draw the colt on his hind-quarters first. In the case of old and big horses, most of us prefer the regular hobbles; and as to the stretcher, if it is not exactly the same thing, it subserves, I fancy, much the same purpose as the Scotch "back strap," which, if properly applied, keeps the animals in much the same position as they occupy in recubation, and draws their legs apart. It has seemed rather remarkable to me that none of those who have seen Farmer Miles operate have attempted to describe the operation; but I suppose they are all bound to secresy. Unfortunately, when Mr. Miles was in Edinburgh I could not put my hand on a cryptorchid, or I should have certainly been much pleased to have witnessed the operation; neither had he time—for which he expressed regret—to show me his casting apparatus or his instruments. Had I known that Mr. Lyford was so conversant with the subject, I should have, during his recent visit to this city, inquired further into it.

There are also a few things in Mr. MacGillivray's "Notes on Castration" which I think worthy of a passing remark. Hæmorrhage, in my experience, proceeds from one of several sources:—

Firstly, from the cutaneous artery being unusually large;

Secondly, from the presence of large vessels in the connective tissue between the dartos and scrotum, and the former and the *tunica vaginalis reflecta;*

Thirdly (when the posterior constituents of the cord are sectated), from unusual development of the artery of the cord;

Fourthly, from an aberrant, and consequently unsuspected artery;

Fifthly, from the divided end of the spermatic artery;

Sixthly, from laceration (or incision with the knife, as in Mr.

MacGillivray's case) of the spermatic artery above the point of section, by the operator dragging violently upon it during the struggles of the animal.

Now, in so far as the question of hæmorrhage is concerned, it is impossible to provide against all the sources of bleeding by one method; but I maintain, as I have always done, that for general purposes no method is superior to the actual cautery. The great mistake in its use is, that too much tissue is destroyed. I have lately adopted the plan, especially in old or large animals, of dividing the whole of the constituents of the cord with the hot iron, so as to catch any small aberrant arteries, and the artery of the cord; afterwards ligaturing the spermatic artery with carbolized cat-gut. This does away with the necessity of destroying so much tissue in the sealing of the artery with the hot iron, and gives *absolute* immunity from hæmorrhage. This practice, or one similar to it, has been carried out by Mr. A. Gray, sen., for a number of years; and although the application of the ligature occupies a little more time—a minute or two,—the inconvenience is counterbalanced by the ease of mind which the operator feels subsequently. I have operated with the *écraseur*, but have not had sufficient experience of the method to enable me to form an opinion as to its comparative merit. It is undoubtedly the most scientific method of operating, and was largely practised by the late Mr. Prentice, of Longford, Ireland, whose son will, I have no doubt, give the correspondent who seeks for advice all the information he may desire.

As to the arrest of hæmorrhage after the animal is on its feet, I see no objection to plugging the scrotum with fine tow (carbolized, if at hand), and securing it *in situ* by the aid of sutures. I have done it on two or three occasions successfully, even where the hæmorrhage was tolerably copious, while in one or two others I have re-cast the animals, and sought for the bleeding vessel and ligatured it.

The mistake usually made in plugging is, allowing the tow to remain for too long a period in the scrotum.

POISONING OF A HORSE BY TEA.

BY F. DUCK, M.R.C.V.S., ROYAL ARTILLERY, ZULULAND.

[THE following communication relative to a case of poisoning by tea is forwarded, under date June 14th, from the camp at Ischlungwena. The occurrence took place at the Matzanhlopi camp.]

On June 2nd, about 11 a.m., my attention was called to a charger belonging to Lord William Beresford, which had been turned out to graze with the troop horses in the early morning. The horse was presenting symptoms of a peculiar character, indicating acute congestion of the brain. He was lying on the ground, and kicking and struggling. When I attempted to take the pulse he got up, ran violently backwards, broke away, spun round quickly several times on his hind legs, then staggered and fell.

For a short period he remained quiet; then he suddenly arose, and at once ran backwards in a direct line for about thirty yards, and, as before, swung round rapidly several times, staggered, and fell.

These symptoms gradually became more aggravated, and the intervals of cessation shorter, while they were of such a character as to cause several bystanders to remark, "The horse is drunk!"

At one time the animal got up, shook his head, and with magnificent action trotted round in a complete circle; then he galloped round, stopped suddenly, ran back as before, and after again spinning round he fell and struggled automatically on the ground, occasionally turning his head and biting at the body behind the shoulder.

About 4 p.m. the horse had fallen into a "donga," and was violently dashing his head on the rocks. As recovery appeared to be quite hopeless, I killed him by passing an assegai through the heart.

The *autopsy* revealed intense congestion of the brain, the vessels on the exterior of both cerebral hemispheres standing out prominently, as if gorged with blood, while the cineritious substance of the organ was dark-coloured throughout. The stomach was full of grass and a little Kaffir corn, and when

opened it emitted an unmistakable aroma of tea; indeed, the entire contents of the stomach were impregnated with this odour. There were slight traces of inflammation throughout the alimentary canal.

The history of the case is as follows:—The staff cook had carelessly kept his reserve supply of tea for the campaign in an empty corn-sack, and after taking out a portion, he had negligently thrown the sack under a waggon. About 7 p.m. the previous evening, the Kaffir groom took this sack, put into it the evening feed for the horses on the staff picket line, and fed them as usual by pouring out of the mouth of the sack a quantity of corn in front of each horse. It was almost dark, and consequently he did not observe anything unusual. The horse which died stood the last on the line, and was therefore the last to be fed. It is accordingly to be presumed that he received the largest portion of the tea—that in the bottom of the sack. In less than an hour the loss of the tea was discovered, and I took a lamp and examined the remains of the feed on the ground, when I found tea mixed with oats. All the horses fed well. It was black tea, and there should have been about ten pounds weight of it. None of the other horses showed any symptoms of illness. No treatment was attempted, as the horse was too violent, and running about everywhere in the Veldt. The column was also moving camp to the other side of the river.

[The case forwarded to us by Mr. Duck is, we are certain, unparalleled in the annals of veterinary, or even human toxicology. We can find no mention of poisoning of mankind by tea, or by its alkaloid—*theine* or *caffeine;* and we are not aware that accidental poisoning has ever occurred in animals. Indeed, according to some evidence, this alkaloid is not toxic. For instance, we are informed that Mr. Cooley ("Dictionary of Practical Receipts," *Art.* "Caffeine") took twenty grains daily for more than a month, without noticing any very decided symptoms. Blyth, however ("Manual of Practical Chemistry," p. 85), states that theine is, in large doses, a poison. Frerichs, C. J. Lehmann, Husemann, and others, have made themselves the subject of experiment. Lehmann, after taking ·5 gramme, suffered from frequency of the pulse, irritation of the bladder,

cerebral excitement, slight hallucinations, and lastly, desire to sleep. Husemann took ·25 gramme, and had somewhat similar symptoms. Pratt, with subcutaneous injections of from ·12 to ·8 gramme, suffered from symptoms rather different from the foregoing; ·3 gramme lessened the pulse and caused sleeplessness; ·4 to ·5 gramme quickened the pulse, and caused a desire for frequent micturition, but no dilatation of the pupil; ·8 gramme caused great uneasiness and anxiety, trembling of the hands and arms, so that he was unable to write, and later a restless sleep, with continual dreaming. According to Strauch, the least fatal dose for cats is ·25 gramme, a quantity which killed a cat in thirty-five minutes. Demberts also showed that in large doses it is fatal to animals, inducing tetanic stiffness of the muscles, an increase in the frequency of the heart's action, and increased reflex action. Indeed, in all experiments on animals there has been increased frequency of the heart's contractions, and repeated emptying of the bladder and intestine.

From its peculiar physiological action, this alkaloid has been recommended as an antidote in opium poisoning. It is therefore probable that had it been possible to administer opium in the above case, it might have had a beneficial effect.]

THE PRINCIPAL FACTS HITHERTO ASCERTAINED CONCERNING *BACTERIA.*

BY J. H. STEEL, M.R.C.V.S., ROYAL VETERINARY COLLEGE.

(Continued from page 7.)

IN the foregoing record of the life-history of *B. termo*, we have described its germs as floating about in the atmosphere. Before we accept this position, we must examine the bases upon which the celebrated "*Germ Theory*" is founded and supported by its originator, PASTEUR. Those who, with him, hold that wherever organisms appear they owe their presence to germs or sporules—complete beings in a state of dormant vitality, the products of pre-existing organisms—are Panspermists. Opposed to them are the heterogenists, or believers in "*Spontaneous Generation*," who consider that under certain conditions matter may become so

aggregated as to constitute molecules influenced by vital instead of chemical or physical force. *Dr. Bastian* is the leading advocate of this view. He believes that he has been enabled to generate organisms spontaneously in an Infusion of Turnip with Cheese, but other observers have not been equally successful in repeating his experiments. Lionel Beale says: "Upon the whole the production of any living form, however simple, from non-living matter, must be regarded as highly improbable."* Bastian affirms: "I maintain that even the very existence of organisms in the fluids and tissues of diseased persons is referable, for the most part, to the fact that certain changes have previously taken place (by deviations from healthy nutrition) in the constitution and vitality of such fluids and tissues, and that Bacteria and allied organisms have appeared therein as pathological products, either by Heterogenesis, or by what I have termed Archebiosis, or "birth direct from a fluid."† His arguments in support of this opinion are—

1. Bacteria during life are found in connection with dying tissue elements, as well deep-seated as exposed, and in equal numbers.
2. Microscopic examination of these cells favours the idea that the Bacteria are engendered in the cells rather than from external contamination.
3. Bacteria are absent from healthy blood, but after death, sooner or later, according to conditions, this swarms with them.
4. Bacteria appear in serous fluids contained in blisters of persons with a temperature of 102° F.
5. A chemical irritant beneath the skin, without external contamination, gives rise to organisms in twenty-four hours.

A little consideration will show us how much support all these arguments lend to the theory of generally diffused germs. And we are not yet in a position to solve the question of spontaneous generation, for we are not yet able to assure ourselves by what means germs, if present in a solution, could be completely deprived of future power of manifestation of vitality. The means of obtaining chemically clean and uncontaminated appliances are—

1. Application of heat. It was supposed that at the boiling point neither active nor dormant life could exist—more recently it has been alleged that germs can resist three hours' boiling (Tyndall) and 300° (Dallinger). It is found also that exposure to a moderate temperature for some time suffices for the destruction of these organisms, thus "the degree of heat is compensatory to its duration." Another point to be noted is that alkaline fluids are most difficult to sterilize, since alkalies increase the heat-resisting power of Bacterids.

* *Veterinarian*, 1875, p. 674. † *Veterinarian*, 1875, p. 858.

2. Calcination of the tubes and vessels used.
3. Purification of the air which is to come in contact with the solution to be preserved after sterilization.
   (*a*) By filtering through cotton wool or porcelain.
   (*b*) By allowing entry of air only after its passage through small-bore and very bent tubes. (Here the germs subside during their progress through the tortuous passage.)
   (*c*) By allowing entry of air only after its passage through strongly heated tubes. (Often these last two methods are combined.)

Germ-free chambers have been constructed for purposes of experiment. Professor Lister's experimental chamber was explained by him before the Pathological Society at its meeting of the 18th December, 1877.* *Tyndall*, before the Royal Institution, showed that an air-tight chamber, covered inside with glycerine, in a few days deposits its germs, which adhere to the glycerine,† and that afterwards cultivating solutions in the chamber remain sterile. A suggestion, with description, for a "Germless Surgical Room" was made by Mr. W. Thompson, F.R.S.E., before the Manchester Literary and Philosophical Society.‡ We may thus express our views on "Spontaneous Generation." Theory, on the one hand, leads us to note that with the march of progress the possible occurrence of life spontaneously has been proved impossible in any but the lowest organisms; on the other hand it leads us to the conclusion that vitality *may* be found to be convertible from magnetism or chemism, and not remain *the* exception to the grand law of the correlation of forces. Life may be converted into heat, and why not heat into life? A potent argument of heterogenists, too, is the question of the origin of the first organism. The glorious theory of evolution, for its complete latitude, requires that the lowest forms of life shall have sprung and do still arise from the inorganic substances around. Francis Darwin has shown us many transitions to vitality as exhibited by inorganic matters. The mode of origin of life is shrouded in mystery; in no one case has it been clearly demonstrated; but future research may remove this cloud, as it has done many another which obscured our examination of truth.

The theory of putrefactive germs is supported by the fact that

* *Med. Examiner*, 3rd Jan., 1878. Vol. iii., p. 14.
† *Veterinary Journal*, 1876. Vol. ii., p. 365.
‡ *Med. Ex.*, 13th Dec., 1877.

other and larger Bacteria than *B. termo* (as we shall shortly see) have sporules, just visible under the highest microscope powers. Tyndall defines a germ, "anything which germinates without reference to its being visible or having anatomical structure of any kind." Richardson considers the "germ theory not quite meaningless, but of minor importance,"* since the germs may commence the decomposition of water and thus putrefaction occur. Dr. Burdon Sanderson tells us "that ultra-microscopic particles exist in all exposed aqueous liquids and in ordinary air there can be no question, but of their size, structural attributes, or mode of development we know nothing"; † he hardly seems to approve of their being called germs. He shows that the putrefactive agent in common water is suspended and not in solution, from the fact that equal quantities used to contaminate like cultivating solutions did not produce equal effects. *Pasteur* proves the same fact by subsidence; for if water is kept still for some time drops from the upper layer are incapable of germination in a cultivating solution, while drops from the lower stratum seem particularly rich in matter capable of producing Bacteria. *Tyndall's* experiments show that ultra-microscopic particles exist in the air and in water in a state of suspension, though these fluids are optically transparent, for a ray of electric light sent through a chamber containing such air or water shows "motes," much as we see small particles in a sunbeam, and it is found that the ray after emergence is polarized, an undoubted result of the influence of suspended solids. Tyndall's glycerine chamber can be satisfactorily understood in the nature of its action, now we are assured that solid particles exist in the air.‡ *Cohn*, rejecting previous methods of testing the air for germs, has found that the slow passage of air-bubbles through cultivating solutions occasionally gives rise to Bacteria, but believes the germs on account of their minuteness as a rule are carried in the bubbles completely through the liquid without becoming thoroughly wetted, and hence germinating. Here we have very satisfactory proof that the ultra-microscopic organisms are really

* *Med. Ex.*, 1878, p. 527.

† "Proceedings of Royal Society," Nov. 22nd, 1877; and *Nature*, 29th November, 1877.

‡ *Beiträge zur Biologie der Pflanzen.* 3 heft, 1875.

germs of Bacteria, for we observe their development. These germs must not be confounded with others much larger floating about with them in the atmosphere, and which may be seen on microscopic examination of glycerine solution of the matter which has been separated by an air-filter of cotton wool. Such develop into fungi, etc. Tyndall has further told us about germs, that they float about the air in clouds, and those in air differ from those in water, in that the latter are in a much more advanced stage of development. Pasteur has confirmed the view that they are more prevalent in some places than in others, for his infusions in many cases remained long unputrefied, though freely exposed to the fresh air of the Jura. *Lister's* views are special; he says, "I have seen nucleated Bacteria myself, but I confess I have never seen anything that has resisted such treatment as these germs are said to have resisted. It is highly improbable that Bacteria have germs; they are absolutely reproductive organs; and if there be any organism in existence which does not require germs, I should say it is a Bacterium."*

This line of argument, it will be seen, is the outcome of Professor Lister's views of the nature of Bacteria, which we shall note later on as being by no means generally accepted. Besides, he argues that there are probably active ferment organisms which are related in size to *Bacterium lactis* as it is to the large *Torula cerevisiæ*, and therefore are beyond the present limits of vision. Finally, the contaminating qualities of ordinary water have been attributed to Bacteria, which are not generally recognisable because of their scarcity. *Dowdeswell* has proved that some certainly exist in a fully developed condition in ordinary water. *Dr. B. Sanderson* finds that "the air is entirely free from living microzymes."† He says that "until there is distinct evidence of germs they had better be left out of consideration;" but this is in speaking of them *as a pathologist.* Until by extra refinement of our means of observation we can actually see the germs of putrefaction, we must consider the germ theory in the light of a valuable "working hypothesis," and so we are warranted in adopting measures as against ultra-microscopic forms of miniature Bacterids or extreme levity, which possess powers of resistance

* *Med. Ex.*, iii., p. 14. † *Med. Ex.*, p. 1040.

considerably greater than those of the adult stage, and which are capable of remaining in a dormant state until placed under fit conditions for germination. We are therefore now in a position to assert, with the majority of observers, that putrefaction is due to living organisms, and we understand that these, in a state of dormant vitality, are disseminated through the air; and it has been long known that contact with the air causes suppuration and retards the healing of wounds. *Lister* argued that such results are not due to the air itself, but to that which is suspended in the air, and which finds, upon exposed wounds, conditions favourable for development. Others argue that it is the contact of dead particles in the air which produces the deleterious effects.* But few deny the beneficial effects of the *antiseptic system of surgery*, which mainly depends not so much on the use of agents noxious or destructive to Bacteria, as on placing the wounded surfaces under such circumstances as will render them unfit to nourish the organisms. Indeed, it is not at all clear how we may obtain freedom from these germs; they pervade the living systems of plants and animals. *Beale* even says he has seen them *inside* cells, and they are ready to prey upon the tissues directly life ceases; also they are capable of resisting very high and prolonged temperatures, and are of extreme minuteness. Indeed, the bacterium of putrefaction is capable of Protean strategy; thus Pasteur has shown us that "in contact with oxygen the bodies cease to move and disappear, being transformed into refractive corpuscles, which in a suitable soil will reproduce the motile vibrios." In infusions of animal and vegetable tissues may be observed granules, of which some exhibit the reactions of fatty, others of albuminoid matters; others differ from these, and are by some considered the germs of Bacteria. Thus M. Lemaire washed a circumscribed portion of a hospital wall, and in the resulting fluid found these granules in great numbers; they were immotile, and affected by the Brownian movement.† As they disappeared, Bacteria proportionately developed. *Béchamp*, who observed these granules in plants and animals, termed them *microzymes;* he believed that they assist in the

* For "Antiseptic Methods" see *Lancet*, 1873, vol. i., pp. 694 and 729.
† *Veterinarian*, 1869.

performance of certain functions, and that they have their diseases and propagate them to the bodies of which they form a part, and into which they penetrate. In the washings of one square metre of a hospital wall recently were found "micrococci in great abundance, some microbacteria, a few epithelial cellules, some pus globules, red globules," etc.* The question as to whether or no germs exist in the tissues of living beings has been much debated. It is generally now considered that they do, and this having been proved seems to account satisfactorily for the decomposition of liver and other tissues when embedded in parafin, and so cut off from a supply of germs from without, as well as for the fact that decomposition after death commences in the tissues which are deeply seated. But if this be the case, why do not they during the life of the animal develop into the adult forms of Bacteria? This is variously explained; some say that they constantly develop, but that the Bacteria pass into the blood, where a fierce "struggle for existence" with the corpuscles and other living constituents occurs, resulting in the defeat of the Bacteria. Others maintain that during life they simply remain dormant, and are constantly removed as granules in the secretions or are stored up in the tissues. *Dr. Sanderson* received healthy blood into a calcined tube directly from the jugular of an animal, and it remained without putrefaction, showing that it contained no germs, or that fluid blood is not a fit *nidus* for Bacterial development. This the doctor explains as perhaps due to their destruction by long exposure to the heat of the body; for Tyndall has shown that such a condition may destroy them, and believes that there is a period of latency between the germ condition and the adult state, during which Bacteria may be destroyed by a comparatively low temperature. Others consider that the ozonised oxygen contained in the blood proves prejudicial to them. A strong argument in favour of the presence of germs in the living body is that artificially-produced effusions into peritoneal or pleural cavities contain Bacteria, even when the injected fluid cannot contain germs. Also *Billroth* has found *Coccobacteria* in closed abscesses. In consequence of their small size, germs are capable of entering the body in many ways, but

* *Students' Journal*, vol. vi., p. 278.

especially through the absorbent and respiratory systems. *P. Bert** has shown that compressed oxygen is prejudicial to the adult *Bacterium termo*, but not to germs. *Messrs. Downes* and *Blunt* have found that light is inimical to Bacteria, and may retard or prevent their development. Light is not essential to the development of Bacteria.† *Gunning*, of Amsterdam, finds that by exclusion of oxygen Bacteria and their germs are destroyed; so that putrefaction will not occur if only filtered air be subsequently allowed to gain access.‡

Difficulties necessarily attend the investigation of the chemical composition of such a minute organism as *Bacterium termo*, but it is stated that its more refractive portions resemble protoplasm in becoming coloured by iodine; they, too, are the seat of active changes in the larger Bacteroid organisms and the parts most universally present; the transparent investment is said to exhibit the reactions of cellulose.

Means of combating these Bacteria—antiseptic measures—consist in placing the substance which is to be preserved in a position to resist the tendency of sporules, to increase and multiply at its expense, or the actual destruction of the bodies. This latter condition has been stated to occur when chlorine comes in contact with them, by the removal of hydrogen from their molecules, when ozone meets them, by direct oxidation, and from carbolic acid, by direct "shrivelling up," and destruction of vitality by abstraction of water. Defensive measures consist in treatment with certain salines and coagulants, as $HgCl_2$, As_2O_3, tannic acid, etc. *Lister* principally relies upon boracic and carbolic acids, and zinc chloride. An important bearing in this connection is preservation of museum specimens, and every practical worker knows that different matters require different preservative agents.

We must now turn to the relations of *B. termo* to disease. *Feser* considers this is a true Pathophyte, giving rise to putrefactive Emphysema—we are not aware that his views have been received. It is principally related to *Septicæmia*, in the elucidation of the pathology of which disease much good work has been done. It seems, however, open to doubt whether the organism concerned

* *Veterinarian*, 1875. † *Nature*, 12th July, 1877.
‡ *Nature*, 5th Sept., 1878.

in the production of this disease is the true *B. termo;* and *Vulpian* "observes well-marked differences in the characters of Bacteria and Vibrios, demonstrable in different instances, and considers true pathological Septicæmia distinct from that produced by experiment,"* and prefers to consider it Bacteræmia. At present we are in the position to state that we know no differences, in appearance, between the Bacterium of putrefaction and the septic Bacterium; they occur in like places, and we cannot separate them. *Pasteur* has found that the Bacteria which occur in the blood in Septicæmia are destroyed when in the adult stage by oxygen, being, like certain other forms, "anærobic,"† but the germs float about in the air unaffected; he also found that they develop with facility *in vacuô*, or in an atmosphere of carbonic anhydride. These conclusions are hardly compatible with some arrived at with regard to *B. termo*; but the literature of my subject abounds in contradictions and misconceptions! *Dr. Burdon Sanderson* has treated this matter in his lectures on the "Infective Processes of Disease." He arrives at these conclusions—that the disease is due to particles which are not Bacteria, but are the products of Bacterial action, that only by some of the numerous successive crops of Bacteria is the poison generated, that some bright red Bacteria are particularly virulent. Recovery after inoculation with septic virus is possible, and the severity of the effects is proportioned to the amount introduced; hence it is concluded that the poison is not living matter capable of self-propagation.‡ Also fluid with virulent properties gave no result when mixed with a cultivating solution. Anders' experiments show that "Germicides," such as chlorine, carbolic, and salicylic acids, are not capable of destroying the virulency of septic liquids. *Pasteur* considers Sanderson's virulent and innocent "crops" distinct Bacteria, the former being different from the latter in being destroyed by the action of the air.§ He finds that the former introduced into the blood cause Septic Fever. *Hiller* proved the innocuousness of the Bacteria by washing them frequently with distilled water, and then injecting them into the blood-vessels of living animals, without deleterious effect. *Drs.*

* *Lancet*, 1873, p. 748.
† *Lancet*, 1878, vol. i., p. 802.
‡ *Medical Examiner*, 27th Dec., 1877.
§ *Révue Vétérinaire*, July, 1878.

Begmann and *Schmiedeberg* obtained well-defined acicular crystals—sulphate of sepsin, by diffusion of putrefying matters through parchment and various precipitations and purifications, deliquescent on exposure to air, and on exposure to heat, melting and carbonizing; $\frac{1}{100}$ gramme of this in solution injected into the veins of dogs, which were slaughtered nine hours afterwards, caused ecchymosis of the large intestines and stomach, and congestion of the small intestines.* Dr. Sanderson concludes that if there were no Bacteria there would be no Septicæmia; they manufacture the substance which has the virulent effects, and no other means of production of this virus is known. Bacteria cannot carry on the septic process in the healthy tissues of an animal.

Having thus dealt with the commonest Bacterium, we will now examine a typical Bacillus, one which is perhaps to us the most interesting of this class of organisms—*B. anthracis*, the pathophyte of Splenic Fever. It is one of the four which have been selected by Dr. Sanderson as "organisms found in the body of pathological importance."† If the blood of an animal affected with Splenic Apoplexy be examined, it will be found to contain motionless rod-shaped bodies, which are considerably larger than *B. termo*. Aqueous humour and a warm stage (32°) prove favourable for the cultivation of this Bacterium. Under such conditions motion has been detected, and hence the value of Davaine's "Bacteridia" or "motionless" forms is disproved. It is described as in twenty-four hours becoming 120 times its original length, and in forty-eight hours presenting minute dots at intervals along it. This is due to the development of spores; they are noteworthy as showing to us that when we have to deal with a large Bacterium we can trace this method of vegetable reproduction: we are thus induced to have more faith in the theory of germ or spore production by *B. termo* and its allies. These spores are highly refractive particles, and escape by rupture of the elongated Bacillus (the only other form in which spores are known to be developed is *B. Subtilis*, as noticed below). *Siedamgrotzsky*, of Dresden, finds the germs in the blood of an animal affected with Anthrax, adherent to the white corpuscles, and he believes "that

* *Veterinarian*, 1869. † *Medical Examiner*, p. 29.

the filterwork of the spleen retains the white corpuscles in its meshes," whence that organ is the most frequent seat of marked lesions; the Bacillus rods are seldom seen in the blood of the living animal.* *Koch* describes the Bacillus as after twenty-four hours forming a network of its filaments. *Ewart's* researches on this form are so valuable that I am tempted to give them in summary.† When kept on a warm stage, *Bacillus anthracis* becomes actively motile. Sometimes a number of rods cease moving, and previous to lengthening themselves out into filaments, arrange themselves into patches of zooglea. Division occurs slowly, the segments being long united together by a thin filament. Several generations may elapse before the motile phase again appears. The rate of development regulates changes, but these are at once checked by a temperature of 37° C.—40° C. The filaments are at first hyaline, but soon protoplasmic contents may be distinguished from the gelatinous-looking sheath. The protoplasm next divides into short pieces, which contract, leaving clear spaces between them, and often again subdivide. At each side of this transverse line of division minute, clear specks appear, the first indication of the spores; they increase in size at the expense of the protoplasm. Shortly after this the filaments seem to be made up of numerous segments, each containing one spore, these lying at the adjacent ends of the segments. Then the filament either bursts and gives exit to the spores after swelling of its gelatinous envelope, or breaks up into shorter parts, or remains *in statû quo.* In either case it undergoes granular degeneration. It is broken up by the fifth day of cultivation, the spores generally escaping on the third. They are motionless, bright, refractive, oval bodies surrounded by a thin, gelatinous-looking envelope, $\frac{1}{2500}$ inch in long diameter (Cohn). They do not always develop into rods, but may divide into four by a process in which the envelope assists. This occurs most readily at 20° to 25° C., and when the cultivation has been continued for seven or eight days, in the same aqueous humour. The rods are developed from the spore, and not, as Koch says, from the gelatinous capsule. When starved, the new rods do not increase in

* *Veterinary Journal*, 1878. Vol. i., p. 96.
† *Veterinary Journal*, 1878. Vol. ii., p. 17.

length, but produce spores. Messrs. *Pasteur* and *Joubert* have also investigated the life-history of this form.* We have ascertained the following points of its life history, in addition to those given above. It requires free oxygen, and is destroyed by carbonic anhydride ; portions of tissue containing it undergo decomposition when exposed at ordinary temperatures ;† *B. termo* appears, and the majority of observers state that it preys upon the Bacillus. Pasteur has shown, however, that "it is an error to infer that putrefaction, as putrefaction, destroys Charbon virulence," for the Charbon organisms are destroyed by the CO_2 generated in putrefaction. After they are dead their filaments undergo decomposition, but the spores remain intact. The adult filaments are destroyed by desiccation, and by a temperature considerably below 100° F. ; the spores are destroyed by a temperature of 37° C., and neither old, dry, nor new spores could survive two minutes' boiling, and spores are rendered inactive by oxygen under high tension (Ewart). The spores and rods remained alive when sealed in capillary tubes, and kept at a temperature near the freezing point.‡ Finally, Pasteur's solution will not support this Bacteroid ; neutral or slightly alkaline urine, and serum from the blood or subcutaneous areolar tissue, are capital cultivating fluids. These organisms were discovered by Pollender in 1855, and Brauell (Sanderson), but French observers independently noted them, especially the veterinary Professor Delafond. Davaine, in 1863, named them Bacteridia. These organisms were at first considered blood crystals, and neglected, as of minor importance. Dr. Hartz, of Munich, clings to this ancient idea, but the discovery of their living nature gave rise to the question as to what influence, if any, they have in the disease of which they are the invariable accompaniment ; at first considered the effect, they are now thought to be the cause by the majority of observers, but not by all. *P. Bert* finds that oxygen at high pressure destroys the Bacilli, but not the virulence of the blood ; also, when a drop of

* *Bull. de l'Acad. de Méd.*, 17th July, 1877.

† *Recueil de Méd. Vét.*, 30th July, 1877.

‡ *Siedamgrotzky* states that in a cold room infected blood loses its potency in a week. Dilution with distilled water, or traces of carbolic acid, prevent development of the spores. But if the blood be in a thick layer or in solid tissue, it may remain virulent for four or five weeks. *P. Bert* finds that the spores are *not* rendered inactive by oxygen at high tension.

blood from an Anthrax case was treated, *guttatim*, with absolute alcohol, it still killed a guinea-pig in less than a day, and the blood of this animal was capable of communicating the disease; it seems, however, neither method suffices to kill the *spores:* though M. Davaine explains these results as due to Septicæmia of the guinea-pig.* *Siedamgrotzky* also finds, after inoculation, general fever and local swelling before the Bacteroids appear.† *Toussaint* believes there are two factors at work in producing the lesions of Anthrax, and *Cohn* states that blood devoid of Bacteria is capable of conveying the disease; that the serum of the coagulated blood, though it contains none of the Bacilli, is virulent; also that Bacteria can exist in the blood without rendering it virulent. *M. Pasteur* successfully combats the arguments of Cohn, showing that he has totally neglected the spores, and confounds *Bac. anthracis* with *B. termo.* It is well-known that inoculation with Anthrax blood will generate the disease, but this is by no means conclusive on the question of whether the disease is really due to Bacillus. The organisms must be separated from all the other blood constituents, and still exhibit virulence. *MM. Pasteur* and *Joubert* give us evidence on this point.‡ They resorted to frequent dilutions of Anthrax blood with distilled water, whereby after a time only the Bacilli of the original constituents remained, and they only by their power of self-multiplication. The resulting fluid was found to convey the disease. It contained no corpuscles, such as M. Chauveau would consider to be the agents of contagion, nor was it opalescent. Also it did not contain a soluble, catalytic, diastase-like substance, for when it was filtered that which passed over retained no virulence. An interesting proof that it is not a soluble ferment which exists in the blood, and conveys the disease, is the fact that the placenta acts as a filter, and a healthy fœtus may live within an Anthrax-stricken dam. The Bacilli were therefore considered the conveyors of contagion, and it is found that they are present in the majority of forms of Anthrax. The virulence of the blood after treatment with compressed oxygen and alcohol, must be

* *Recueil de Méd. Vét.*, 30th May, 1877; and *Comptes Rendus*, 21st May, 1877.
† *Deutsche Zeitschrift für Thiermedicin*, i., 4.
‡ *Lancet*, 1877, i., 209; and *Recueil de Méd. Vét.*, 30th May, 1877.

attributed to the power which the spores possess of resisting such influences, which would destroy the adult organism. *Pasteur* observes that Anthrax blood contains no other organisms than these specific Bacteria, which disappear from liquids in the presence of CO_2. With regard to the method in which communication of the disease may occur, the received opinions on this point are—

1. That it depends largely upon the nature of the diet, since it occurs especially in highly-fed animals.
2. That it may be obtained from food or water.

The first opinion may be by some thought to imply that under especially the influence of high feeding, the blood may become so modified as to be capable of generating the Bacillus organism. It seems to us that these facts tend to afford additional support to the germ theory. But we have some quite recent experiments bearing upon this question. *M. Pasteur* has investigated the "spontaneous" Anthrax. He finds that almost invariably the mouth is first affected, and by feeding animals upon fodder moistened with a Bacillus-bearing liquid, he observes that the disease does not invariably appear, but is most liable to do so when the mouth is injured, or when the food contains thistles or other such irritant matters.* *M. Toussaint*, by laborious investigations, shows that the Bacilli may be always traced from their place of entry through the lymph vessels and glands. In this way in cases of Anthrax deemed "spontaneous" he almost always finds the mouth first affected.† There are several theories upon the subject as to how death is brought about in cases of Anthrax. Some consider the Bacilli remove the oxygen from the blood, others that they cause mechanical or specific irritation; the most satisfactory theory at present is that of *Toussaint*, of Toulouse, who considers they produce mechanical asphyxia by plugging the minute capillaries of the lungs.‡ He first of all showed that the presence of a large quantity of oxygen in the air will not keep a patient alive, and then that the lungs often seem completely anæmic through want of access of blood, which the microscope showed to be due to the plugging of the

* *Veterinarian*, May, 1879, and *Rec. de Méd. Vét.*, 28th Feb., 1879.
† *Lancet*, 1879, i., 380.
‡ *Recueil de Méd. Vét.*, 30th Jan., 1878, p., 72.

vessels by Bacilli. A remarkable fact has been noted with respect to the non-liability of birds to injury from inoculation with Anthrax matter. MM. Pasteur, Joubert, and Chamberland have attributed this to their high internal temperature, since it has been shown that a moderate temperature prolonged will destroy Bacteria.* They endeavoured to remove this condition by the prolonged application of cold to the surface of the body, and so succeeded in developing Anthrax. They also proved the converse, that Bacteria become absorbed and the disease ceases when warmth is applied, unless the case is very far advanced. *M. Cohn*, however, opposes these conclusions, and considers "there is no constant relation between the normal temperature of animals and their aptitude, or the reverse, for the development of Splenic Fever;"† since lowering the temperature of birds to 104° F. does not determine development of the disease, though it occurs in sheep, in which animal this is the normal temperature; also depression of temperature to 99° F. or 100° F. in Carnivora was insufficient for the development of the disease. This must be considered at present unsettled; but I may observe that M. Pasteur has based certain therapeutic suggestions upon his theoretical observations.

Recent research has demonstrated that there are forms of Anthrax in which *B. anthracis* is not found in the blood. For a long time such cases were considered as proofs that the presence of living organisms is not essential to Anthrax. But in *Comptes Rendus*, No. 2, 8th July, 1878, is an important communication by *M. Toussaint*. He found in the blood of a horse which died from Anthrax no traces of vibriones nor Bacteria; nevertheless it destroyed fifty-four animals, the total number inoculated with it, in ten to fourteen hours. On *post-mortem* examination the muscles were found to be pale, but the small vessels all gorged with dark blood. A microscope power of 500 to 800 diameters showed in the blood, in the proportion of about five to ten for every corpuscle, spherical, or slightly oval vibriones, with scarcely any refraction, and slow and feeble movements. Generally solitary, never in groups of more than three, $\frac{1}{10000}$ mm. in thickness, $\frac{1}{2000}$ to $\frac{1}{1000}$ mm. in length. These

* *Compt. Rend.*, No. 2, 8th July, 1878. † *Lancet*, 1878, i., p. 802.

often blocked up the capillaries, and were found everywhere in the tissues and the fluids. In two and a half hours one produced by fission twenty-two others, but these never assumed the filamentous form. It is aerobic, and capable of developing in company with *B. anthracis*, in serum of dog's blood, for instance. It gives rise to real globular sporanges!

It is important that we should be able to distinguish living ferment organisms from those matters such as it is presumed exist in salivary, pancreatic, and gastric juices, and other fluids. These latter are capable of entering into solution, and it has been considered that filtration through porcelain is sufficient to separate them from the organised forms, but it is not yet shown that the ultra-microscopic germs may not pass through such a filter; indeed, we do not yet know satisfactorily the difference between living and non-living ferments! *P. Bert* believes that while compressed oxygen destroys living ferments, it does not affect the non-living.* *Müntz* shows that living ferments are most active at 25°-40° C., and chloroform arrests their activity, but does not that of non-living ferments, which all are more active at much higher temperatures.†

The question of the *nature of contagium* is one upon which I can but touch here. Its discussion has been very similar to that upon the nature of putrefaction. The following theories upon the subject are held:

1. Contact of two organisms produces like modifications (reciprocal movement of matter).
2. Dead matter in a state of change is capable of transmitting its condition under fit determinants.
3. Material particles from living bodies are capable of grafting on to other bodies, and so giving them like properties.
4. Organized bodies directly convey disease from one animal to another (Chauveau).
5. Organic germs pass between animals and generate in them like conditions.

Thus *Chauveau* tells us cells are the bearers of contagium; the last theory leads us to infer that the diseases are due to such organisms as Bacterids, and the germs of these give rise to disease by entry into the system. *B. anthracis* seems to us to prove that at least in *one* disease such conditions may occur, and

* *Recueil de Méd. Vét.*, 30th May, 1877.
† *Veterinary Journal*, 1876, i., p. 214.

the life-history of certain of these Schizomycetous organisms exhibit some remarkable points of accord with the progress of contagium. We need dwell on this matter no longer here.

Bacillus subtilis is interesting as being very closely allied to *B. anthracis*. *Cohn* obtained it from the rennet of a calf; its activity is destroyed below 30° C. It is actively motile, long, fine, generally paired, sometimes in fours or eights. If the fluid in which these are found be kept for some time at 30°, there are to be observed fibres with a swollen extremity filled with oval, slightly refractive granules, either heterocysts or spores. *B. subtilis* occurs also in white mucilaginous masses annually in certain Anthrax districts, where its presence in quantity indicates that conditions have been favourable to the development of *B. anthracis*.*

B. ulua (Cohn) is remarkable for the thickness and rigidity of its filament. *Cohn* found it in stale infusion of boiled egg. *Bollinger* finds Bacteria about five micromm. in length, with a peculiar rotatory motion around their long axis, to be the cause of "Black Quarter" *(Emphysema infectuosum)*.†

Mr. Hutchinson tells us that though no one has yet seen Syphilis yeast, "some one will see it some day;" and the same may be said of the contagium of Rabies and some other maladies. To illustrate the general bearings of my subject in this relation, I now give some of those diseases with the genesis or course of which Bacteroid organisms have, or are supposed to have, relation:

In Diphtheria, micrococci have been seen in the blood (Sanderson).‡

In Cholera, *M. Lemaire* found Spirillium Volutans, Monads, Cercomona, and Crassicandra in the fæces.§

"I am unable to account for Cholera without attributing it to specific organisms" (Sanderson).

Drs. Lewis and Cunningham, however, consider the so-called "Cholera bodies," or "Zooglea Choleræ," as remarkably transformed blood corpuscles.‖

* *Veterinary Journal*, i., 1878, p. 424. † *Veterinary Journal*, 1877, p. 392.
‡ *Medical Examiner*, p. 27. § *Veterinarian*, 1869.
‖ *Lancet*, vol. i., 1873.

Böllinger describes a case of Pneumomycosis in the horse due to *Zooglea pulmonis equi.**

Wagner traces the same malignant pustular disease, when affecting the intestines (*Mycosis intestinales*) to parasites.†

Spirochæte febris recurrentis gives rise to recurrent fever in India (for which consult Dr. Burdon Sanderson's "Report of the Medical Officer of the Privy Council, &c., N.S." No. III., 1874, p. 41. Also for figure photographed by Dr. Koch's method, see Cohn's Beiträge, b. 2, h. 3, p. 399).

Dr. Klein believes he has discovered the specific organisms of Sheep Pox.‡

They have also been found in Rinderpest, Cow-Pox, Erysipelas, etc.

MM. Christal and *Kiéner* find Bacteria in the blood, pus, and glands, in Farcy and Glanders.§ They describe two varieties: Spheroid granulations of variable diameter—homogeneous, refractive, seemingly transparent or black—with a rapid gyratory and translatory movement, ·0012 mm. in diameter at most; or spindle-shaped bodies, refractive and homogeneous, varying in length from ·002 mm. to 1·010 mm. The movements did not continue longer than six hours. When motionless, they were united and formed irregular, granulated masses. These were relatively few in number in the blood, but very numerous and of large size in the vascular glands and in the ulcerations. It was thought by these observers that the Bacteria might be useful for diagnosis of Chronic Glanders.

Bert finds that compressed oxygen does not neutralize snake poison, nor vaccine nor glander matter.‖ Sometimes Bacteroid organisms are found in fluids and tissues without causing disease. Thus *Eberth*, of Zurich, finds oval and actively motile Bacteria often in strings of two or three, in ordinary sweat, and he says they may accumulate around the hairs, or even penetrate them.

We may now hastily review certain innocent Bacteroid, and what light they can throw upon our inquiry into the general nature of these low organisms.

Leptothrix is a form best known as *L. buccalis*, which occurs

* *Veterinarian*, 1871, p. 361.
† *Veterinarian*, 1875, p. 214.
‡ *Veterinary Journal*, 1875, p. 134.
§ *Journal des Vêts. du Médi.*
‖ *Comptes Rendus*, vol. 88, p. 11-30.

in the human mouth, especially on awakening in the morning: it is constituted of long chain-like filaments, which are transparent and so delicate as to break up into their component cells on being touched. It has a slow, undulatory movement.

Vibriones resemble Bacteria, but have bent joints and a rotatory motion—*V. rugula* and *V. serpens*.

Micrococci are rounded cells, which may be solitary or united into chains, or united by gelatinous matter into masses of *Zooglea* —the *M. vaccinæ* (Cohn), *M. diphtheriticus* (Dertil), *M. septicus*, (Klebs), and *M. bombycis* (Béchamp).

Spirillum consists of a long single or double spiral thread. *S. volutans* is the most common form, and is by far the largest of the Bacteria; it is found in the decomposing tissues of the water-snail, and on it may be detected a cilium at each end, which render it capable of rapid vibratile movements.

Spirochæte is longer and more closely curled, with very active serpentiform movements, and undulations passing along its whole length. It occurs in marshes, but is not common.

(*To be continued.*)

THE EXTRACTION OF THE MOLAR TEETH OF THE HORSE.

BY A. H. SANTY, F.R.C.V.S., NORWICH.

I VENTURE to forward a few remarks upon the above subject, thinking they may be of some practical use, at least to the younger members of the profession. As many have told me they have not attempted to extract the molar teeth of the horse, especially those posteriorly situated, I had the pleasure of demonstrating the method and the instrument (a drawing of which I send; the instrument may now be had of Messrs. Arnold) before the members of the Norfolk and Eastern Counties Veterinary Medical Association at their last meeting, when some members, to whom I had previously lent the instrument, gave evidence as to its great utility and the necessity for the operation. Indeed, I think that in our examinations for soundness, none are complete without a thorough examination of the molars, as I have seen horses useless from disease of the teeth and alveolar pro-

cesses; and in such cases I always reject them as unsound. Horses are frequently brought to me in an emaciated condition, and becoming every day less able to do their ordinary work; in many cases I find on examination that there is generally between the fourth and fifth, or fifth and sixth molars, a deep hollow, and consequent receding of the gum from the tooth to a great extent. The hollow is mostly filled with decomposed and partly masticated food, and emits an extreme fœtor. This is frequently the case on each side of the lower jaw. I will give one instance, though it could be multiplied by tens. A grey carriage-horse, formerly the property of a surgeon in this city, was sold about two years since, to a lady not far from here. The animal was in splendid condition, and remained so until the beginning of this year, when he began to look thin, and continued to do so until he was quite unfit for work.

I was requested to examine him and ascertain the cause. I could detect no constitutional derangement, but found the fifth molar on each side of the lower jaw diseased. I extracted both teeth on the 20th of May, and in fourteen days the coachman called with him in the carriage; he was then very much improved, and when I last saw him he had regained his former condition, and was reported as feeding well, which he could not do before the molars were extracted.

The teeth are not often diseased on their crown, but at the side, except when we find them diseased in the upper jaw, which is of less frequent occurrence, and then it is generally the third or fourth molar. The molars are then generally affected with Caries of the body of the tooth, and this is an occasional cause of Nasal Gleet (see case recorded by me in the *Veterinarian* for November, 1875).

There must also be disease, either primarily or secondarily, of the alveolar processes. I am inclined to think that the former is the case, and that it is caused by some acid formed by the accumulation and consequent decomposition of food; but I am at a loss to account for it being nine times out of ten at the fifth tooth. Perhaps some of the readers of the VETERINARY JOURNAL will be able to point out the cause.

To demonstrate the way of performing certain operations is

often difficult, but to describe it is, in my opinion, much more so; though in this case my task is comparatively an easy one, as the whole business is very simple. The animal being cast, I use Professor Varnell's balling iron to extend the jaws, and have an assistant to hold the tongue, while another, with a long smooth iron, pushes the cheek out of the way, and make quite sure that I get my forceps on the right tooth, and that only; when this is done I give a slight rotatory motion, then place my lever on the anterior tooth, immediately under the rivet of the forceps, and raise the tooth, which must come. When I know the tooth is loosened, which I can tell by a peculiar sucking noise, I take a fresh hold of it a little lower down, and incline it slightly to the inside, at the same time raising it—then out it comes without any injury to the jaw. In no case have I found injury at the time or afterwards to the anterior tooth from the pressure of the lever.

I can extract the longest molars, and frequently the fifth one, without breaking a fang, and have seen Mr. Whitwell, my late partner, extract the sixth. I do nothing to the jaw subsequently, and merely order soft, nutritious food for the patient. I never saw anything but good results follow the operation. The instrument is an improvement on one invented by my predecessor, Mr. T. Wells, M.R.C.V.S., Norwich, and used by him successfully for a number of years.

LAMINITIS OCCURRING AT GRASS.

BY W. STANLEY CARLESS, M.R.C.V.S., LINCOLN.

ON July 3rd an interesting case of Laminitis came under my notice. The subject was a mare, eight years old, which had been running on the common here for some months, and was taken up on the night of July 2nd by a boy, who did not observe anything amiss with her. The following morning, on the owner going to the stable he found the animal in great pain, and at once sent for me. I discovered her to be suffering from Laminitis, and saw her again in the evening, when she was much worse. The attack proved to be a most severe one.

The owner informed me that she had not been allowed any

corn for two months, and that she had no distance to travel on the road from the common.

Though on such a poor pasture, the mare was very fat; she had never been unwell before this attack.

This is the first case I have seen of Laminitis occurring when an animal was on grass. We have many cases of Laminitis here, due to the usual causes.

A NEW DISEASE ACCOMPANYING CONTAGIOUS PLEURO-PNEUMONIA IN QUEENSLAND.

BY P. R. GORDON, CHIEF INSPECTOR OF STOCK, BRISBANE, QUEENSLAND.

I SEND herewith a short description, by Mr. Geary, a practical grazier, of a disease that accompanied an outbreak of Pleuro-pneumonia in one of the far inland districts of this colony recently. It caused severe losses amongst several mobs of fat cattle that were being travelled to market.

Perhaps some of the contributors to the VETERINARY JOURNAL may be able, even from this meagre description, to state what the disease was, or the probable cause. By doing so they will confer a favour on many of the Australian readers of the Journal.

"During the last severe attack of Pleuro-pneumonia in the Warrego district, it was accompanied by a phase of the disease I had never previously seen, although, as you know, I have had a vast experience in the disorder. I first saw this form of the disease in a travelling mob of cattle that were in low condition. The first symptoms were those usually observable in Pleuro-pneumonia. These were in every instance followed by a rapid swelling of the upper part of the flank and body, from the hips forward, generally on the near side. The animals appeared to suffer severely, and about the sixth day, when the swelling was at its worst, a black and most offensive diarrhœa set in. The animals at this stage made for water, and generally after drinking freely died almost immediately. The whole course of this (to me) new disease never exceeded a week; it was shorter in the case of young cattle.

"On opening one that died, I found the usual symptoms of 'Pleuro' in the lungs; the stomach on the swollen side was very much discoloured and adhering to the side, and the small intestines were black and generally inflamed throughout.

"I have known cattle to recover from an attack after the swelling stage, but never after it had reached the black scour' stage. Cattle even that recovered from the earlier stage were mere shadows ever after.

"The pasturage at the time was dry, but the herd was in prime condition, and the attack of 'Pleuro' passed through it in a light form generally, with the exception of those attacked as described. The disease caused considerable anxiety amongst stockowners on the Warrego at the time; but as the 'Pleuro' spent itself in the herds, the 'black scour' disappeared with it."

ON THE UTILIZATION OF HORSES WHICH HAVE UNDERGONE PLANTAR NEUROTOMY.

BY GEORGE FLEMING, F.R.C.V.S., 2ND LIFE GUARDS, WINDSOR.

THE benefits to be derived from the operation of plantar neurotomy appear to have been appreciated long before the malady, for the cure of the lameness of which it is most frequently practised, was known. The history of the operation and the disease itself may not be familiar to many or any of the younger members of the veterinary profession, and it may therefore not be uninteresting to them to know that my researches have shown (*vide* "Horse-Shoes and Horse-Shoeing," p. 500) that the unknown author of the "Grand Maréchal, Expert et Français," published at Toulouse in 1701, lays down directions for the performance of neurotomy in the plantar region, and recommends the operation for abolishing lameness due to disease of the foot.* The operation was re-discovered by Moorcroft at the commencement of this century, and Professor Sewell claimed the credit of

* "Vous coucherez le cheval, ensuite lui ouvrirez la partie où l'on barre la veine, et en tirerez le nerf avec la petite corne ; apres quoi vous le graisserez avec du populleum, et il guerira."

again discovering it in 1816. The disease, wrongly designated Naviculararthritis, and for which neurotomy is generally resorted to, was fairly well described, and the symptoms, as well as the pathological appearances, lucidly enumerated by Osmer in his "Treatise on the Diseases and Lamenesses of Horses," published about the middle of the last century. The "Navicular Disease" is supposed to have been first described by the late Mr. Turner, of London, some forty years ago.

When neurotomy has been properly performed, and there has been no mistake as to the seat of disease, or as to the suitability of the case for operation, then the lameness symptomatic of the malady disappears through the consequent partial or total loss of sensation in the foot. Partial loss of sensibility is obtained by division of a branch of the plantar sensory nerves on the inner and outer aspect of the phalangeal region; while total deprivation is ensured by section of the main trunks of the same nerves in the metacarpal region. In consequence of the uncertainty of a successful result, I have for many years discontinued the "low operation," and now practise division of the nerves only above the fetlock. Of the humanity and utility of neurotomy there can be no question whatever, and provided the cases are well-selected and the operation is efficiently performed, the advantages to be derived from it are most striking, as well as enduring. But the disadvantages attending the loss of sensation in the foot have been brought forward on many occasions as an argument against neurotomy, and no one can deny that a foot with sensation is better than one without that faculty. But in a long experience of the operation, I have never found these disadvantages outweigh the great advantages which have immediately followed it, even when the foot has been punctured in shoeing or otherwise seriously injured. The process of repair is as active, if not more so, in the foot without sensation as in that possessing it.

But the strongest argument offered against plantar neurotomy, is that it deprives the horse's foot of the sense of touch, and therefore renders the subject of it unsafe for travelling, and especially for carrying a rider, particularly over broken or uneven ground. This argument we have heard employed by

men who were nothing if they were not "practical," and yet they could not offer any instances in which "neurotomised" horses had stumbled or blundered, or had a greater tendency to do so than those which had sensation in their feet. Their objection to the operation in this respect was purely theoretical, though they would be the first to repudiate the imputation that they were "theorists." We have often suggested the desirability of submitting certain lame horses to the operation, but have been met by a refusal, on the plea that the horse would be unsafe to ride. More especially has this been the case in cavalry regiments, and many an excellent troop-horse have I had to recommend to be sold which would have performed excellent service for years, merely because the commanding officer or inspector-general of cavalry had acquired the notion from somebody that "unnerved" horses were dangerous to ride.

That the tactile sense in the horse's foot is useful, it would be idle to deny; but that it is absolutely essential, even, to safe progression, no one who has paid attention to the results of plantar neurotomy will maintain. On several occasions, for years I have hunted, hacked, and driven horses which had been deprived of sensation in their fore-feet, and never had an accident with them. Their action has not been impaired by the operation; on the contrary, it was vastly improved, compared with what it had been previous to it. And my experience has not been singular in this respect, as many competent horsemen can give like evidence after long and severe trials of neurotomised horses. The opponents of neurotomy were probably not aware that there is in progression a *muscular* as well as a *tactile* sense.

Quite recently two excellent examples of the erroneousness of the theory have occurred, which are worth recording if only to rescue a most valuable operation from unmerited disparagement. Two of the finest among the many fine horses in the Second Life Guards, were so lame from Navicular Disease when I joined the regiment, that they were unsafe and unsightly to ride, and were therefore entered on the list to be cast and sold. One was so crippled that it could scarcely be moved out of its stable. Feeling sorry at having to get rid of such good horses, and anxious to give another blow to the mistaken theory, I obtained the consent of my

commanding officer, who patronises practical conclusions, to perform neurotomy. This was carried out on both horses about eighteen months ago; within a fortnight they were at their duty, absolutely free from lameness, and with first-rate action; and one of them, from being troublesome and unsteady in the ranks—probably from the pain in its feet—had become quite steady and tractable. Instead of being lame, blundering, and unsafe, both were sound, free in movement, and secure; and the pain being abolished, they looked improved in condition.

During the month of July the regiment attended the summer drills at Aldershot, and five days every week for a month these horses carried a weight of about twenty-two stone each over the roughest and most dangerous ground, nearly always at a fast pace, and for four, five, or six hours each day; and yet they never fell or blundered, and the troopers who rode them had unbounded confidence in their sure-footedness. They returned to Windsor at the end of the month's severe test as sound in their paces as when they left, and certainly now offer no indication whatever that they are less safe to ride than any other horses in the regiment. The effects of the relief from pain are also most marked, not only in the altered gait out-of-doors, but also in the stable.

From my experience of plantar neurotomy, I can confidently recommend its adoption by army veterinary surgeons. A hint to them, as well as to others who may not know how to perform the operation neatly and expeditiously, may not be unacceptable. Never make the incision through the skin with the knife, but use the ordinary rowelling scissors. Raise a small fold of the integment immediately over the course of the nerve, but transverse to it, and cut through it with the scissors. The incision should not be more than half-an-inch long, there is no hæmorrhage, and the nerve is exposed by a few touches of the scalpel in a few seconds. Incising the skin by means of the knife is clumsy, slow, and not always safe. The only instruments required are a pair of rowelling scissors (I usually shave off the hair previously with a sharp scalpel), a scalpel and forceps, an aneurism needle, and a narrow and short probe-pointed bistoury.

Editorial.

RABIES AND HYDROPHOBIA IN IRELAND AND ENGLAND.

IRELAND appears until recently to have enjoyed special immunity from *Rabies Canina*, and in "Rabies and Hydrophobia" we have commented on the fact that, while the disease was very prevalent in England and on the Continent, the sister island did not furnish an instance. True, now and again, and after long intervals, a man, woman, or child died of Hydrophobia, and sometimes an instance of cow, horse or pig perishing from Rabies was reported; but so rare were these cases, and so widely were they separated by time and distance, that those who maintained the spontaneous origin of the malady against they who asserted that it is always due solely to contagion, found their strongest support in the history of Rabies in Ireland.

Of late, however, this exemption from a terrible and terrifying scourge has, unfortunately, not been so marked, and there is reason to apprehend that it may manifest itself more frequently than heretofore.

A most painful case occurred in Dublin in July last, which is instructive in more ways than one. A Miss Collins, aged twenty-five years, the daughter of a physician in the Irish capital, died of Hydrophobia on the 30th of that month, in the Meath Hospital, whither she had been removed from her home a day or two previously. It appears that this unfortunate lady had a favourite fox-terrier which manifested a changed disposition, and on the 9th or 10th of June escaped from the house, after exhibiting a surly temper and tearing carpets. On the 11th of that month the animal returned, and its head was then found to be very much bruised and cut, as if it had been fighting with other dogs. While the deceased had it in her arms attending to its injuries, it seized her by the lip and clung to it for a short time. It was subsequently locked up in a room, and in twenty-four hours it died, with well-defined symptoms of Rabies. The wound in the lady's lip was cauterized by a doctor not long after its infliction, and nothing was noticed until July 27th, when she complained of neuralgic pains or "twitchings" in the lip; on the 28th the more serious symptoms of Hydrophobia appeared, and on the 29th she was removed to the hospital, where everything possible was done to save her, but without avail. The lady showed the greatest possible courage and presence of mind, and though she never mentioned the disease, yet she requested those about her not to approach too closely, lest they might be infected; she also hoped she might not be smothered.

The lesson to be derived from this sad case is the great need that exists—a need which we are almost tired of repeating, and have done our utmost to supply—for people who keep or come in contact with dogs knowing the early symptoms of Rabies in these animals. Miss Collins' fox-terrier presented the most suspicious indications possible of the presence of the disease before it escaped from her house, and still more so after its return. The altered, morose temper, the tearing

the carpets, the escape from home, and absence of a day or two, the return home worried and fagged—these are all as characteristic of Rabies as the pustular eruption and fever are of Small-pox. Had the poor lady known anything whatever of dog-madness, she would undoubtedly have put the dog in a safe place, if not before its escape from the house, at least immediately on its return.

In our work on Rabies, and whenever we have had an opportunity of doing so, we have suggested to the authorities—nay, we have begged and implored them—to give this information to the public, *by having it printed on the dog-license paper.* The Paris authorities have adopted this suggestion, and for every human life lost from the disease our government is more or less to blame until it adopts this simple and inexpensive measure. We shall not surely have to wait until some high personage or official dies of Hydrophobia, to see something done for the suppression of so horrible a disorder!

Another feature in this case is not without interest to the pathologist. Rabies is a rare disease in Ireland, and there is nothing to show that the fox-terrier which bit Miss Collins had been itself bitten previous to its appearing indisposed; indeed, so far as we are aware, there have been no cases of Rabies reported in Dublin recently. How or where, then, did the dog contract the disease? or is this another instance of so-called "spontaneous origin," like that we recorded in an early number of the Journal as occurring at Rochester, where for years previously nothing of the malady had been known, and no case has been witnessed since?

We would earnestly warn the authorities in Dublin, and for miles round that city, to be on their guard against outbreaks of Rabies. No one knows how many animals the fox-terrier may have wounded during his long, rabid excursion; it is only too evident from his maimed condition on returning home that he had been in more than close contact with other dogs, and it is still more evident that his saliva must have been very virulent and potent.

In England the disease still appears to be sadly prevalent, though we have nothing except casual evidence to base our assertion upon. The veterinary department of the Privy Council is evidently of opinion that the welfare of sheep and swine is of far more moment than that of the human population. In the north, and particularly in Lancashire and Yorkshire—which have for years been centres of rabific infection—cases are continually occurring. One of the most serious happened in the former county quite recently, and as we go to press, the third human victim of five—one report says twelve—bitten by the same dog at Preston, has died. This case is as interesting in its history as that occurring in Dublin; and as the details have been forwarded to us privately from the owner of the dog, we offer no excuse for offering them here, as they are instructive to veterinary surgeons, and others who are interested in this disease. The Rev. G. R. Pughe, vicar of Mellor, near Blackburn, was the owner of a mastiff bitch, "Varna," thoroughbred, and with a long pedigree. She had been in his possession previous to last September, and was one of a litter of twelve; her dam was remark-

ably quiet, and had not been accustomed to be chained up. The sire was a very quiet dog. The bitch was almost a year old in May; she was remarkably gentle and docile, and had the run of the house, being a great favourite with the children, young and old, who could take any liberty with her, and she was the most gentle, affectionate, and admired of all the many dogs this gentleman had possessed. She was perfectly free from any symptom of disease or ferocity. There were two fox-terriers kept in the same establishment.

On April 8th the bitch appeared to be "in heat," and was therefore tied up in a coach-house; the larger of the two terriers was removed to a place not far off, and the other was chained in the coach-house, though beyond reach of the bitch. She was led out for exercise on five days by the vicar and his son. On April 14th she was sent to a mastiff dog at Witton, and there was nothing whatever suspicious about her then. At Witton there were two mastiff dogs—both old, on chain, and savage. The best of these two would have nothing to do with the bitch, and she bit him on the ear. She was then chained and shut up with the other mastiff in a stable, but she bit him also. Mr. Pughe was not told that either of these dogs bit the bitch, but her neck subsequently showed the scars of wounds. On April 15th she was fed by a young man, and on the following day she got loose and bit him on the finger; the bite was afterwards cauterized. She also bit another man at this place. She was pursued by people with sticks, but found her way home, after worrying a dog on the road, and getting into the carriage-drive of a friend of Mr. Pughe's, where she lay quietly, then bit a dog which was with some children, shaking it twice, and being whipped away by a cabman. On arrival at the rectory, a servant girl reported that "Varna" (the bitch) had returned without her chain and collar, that the animal had jumped at the sexton—whom she knew well—to bite him. Mr. Pughe saw her in the kitchen; her neck looked ruffled and swollen; but he stood by and patted her, while a young child carelessly struck her with a top whip, but she was perfectly tranquil, though apparently distressed, and making a complaining, unnatural kind of noise. A young girl was told to put a light chain round the bitch's neck, and this was done—the animal being then led into the coach-house by the girl, no suspicion existing that "Varna" was mad. Soon after she was seen shaking the terrier outside the coach-house, with the girl near, and who was also snapped at several times by the now infuriated bitch, but not wounded. Mr. Pughe shot at the animal as she lay with her head between her paws looking at him, but she only rose and howled, and at the second shot ran away. On following her, it was found that she had dragged a sheep into the River Darwen and bitten off half its head. She was driven off and then swam the river. We commend this part of the narrative to those ignorant persons who have the temerity to assert that rabid dogs are afraid of water. She was hunted until dusk, when it was reported that she had been shot. On May 14th or 15th Mr. Pughe heard that the two mastiffs at Witton had been shot, one having "gone raving mad," bitten off its own claws, and dug a hole large enough to bury itself in.

Such is the history of this bitch, from whose bites three people have already died of Hydrophobia.

As to the origin of the disease in her, nothing satisfactory can be gleaned. Mr. Pughe holds the following theories, which are given for what they are worth, as there is no evidence whatever that the bitch had been inoculated before being sent to Witton :—That the animal had set her affections on one of Mr. Pughe's dogs, or some other dog—two having been seen near the rectory; that being in "rut," the outbreak may have been due to over-excitability; or one of the dogs at Witton, that afterwards went mad, had communicated the infection to her while fighting —though to become rabid in so brief an interval, he confesses, seems impossible.

The anguish, not to mention the trouble and expense, which this clergyman has suffered, have been very great, and it is to be feared they are not yet ended.

The genesis of Rabies is yet, we are ready to confess it, involved in obscurity, and the foregoing cases do not tend to throw light upon it. Nevertheless, we must accept facts before theories, and must admit that if the maintenance and diffusion of the terrifying malady is to be ascribed solely to its contagious principles, instances are by no means rare in which contagion does not appear to operate in its production.

SWINE PLAGUE IN AMERICA.

ACCORDING to the *Weekly Indiana State Journal*, Dr. D. W. Voyles, of the commission appointed by the Bureau of Agriculture to investigate the causes, nature, and best mode of treatment of Swine Plague, or "Hog Cholera," as it is called in America, has made a full report of his observations. The doctor spent a great deal of time investigating the subject, and sums up the results of his observations in a very readable manner. It is evident that he has proceeded, in the study of his subject, systematically and intelligently, and his conclusions are entitled to weight. We present the material portions of his report in full. It opens with a reference to the general prevalence of the disease, and details the plans adopted in his investigations. His observations were made in the counties of Floyd, Harrison, Washington, Putnam, Green, Owen, Morgan, Monroe and Bartholomew. The knowledge and experience of many stock-raisers and dealers were made use of, and dissections were made of a large number of carcases. Not only were the carcases of animals that had died of the disease dissected, but animals in all stages of the malady, from the earliest symptoms to the hopeless stage, were killed for the purpose of dissection. Care was taken to determine whether the disease, as it prevailed in one section, was identical with that prevailing in another. The symptoms which manifest the appearance of the disease, and the course it takes, are given in detail, but as they are familiar to every stock raiser they are omitted. The report proceeds as follows :—

PATHOLOGY.

As before stated, all dead animals, not too far advanced in decomposition, were examined, and one or more sick animals were selected from each diseased herd, and, after a careful study of their symptoms, as compared

with the symptoms of the other sick stock of the herd, they were slaughtered for examination also.

Memoranda of thirty dissections made from fifteen separate and distinct herds, fairly representing the disease as observed under all the varied circumstances as to locality, soil, food, water, and general management, show the following result :—

In every case, without exception, disease of the lungs was present, varying in degree from slight congestion to complete softening from suppurative inflammation. In two cases the lung disease was tuberculous in character.

In eight cases adhesion occurred between the costal pleura and the lungs.

In six cases circumscribed spots of inflammation were found on the walls of the heart and its investing membrane, with effusion in the pericardial sac.

In six cases congestion of the mucous membrane of the stomach.

In four cases small patches of ulceration of mucous lining of large intestine.

In four cases slight inflammation of mucous membrane of small intestine.

In all cases the liver presented a darker hue than natural. In four cases slightly, and in one greatly enlarged, but in all others in size and general appearance would compare favourably with that organ as observed in animals usually regarded sound.

In four cases there was enlargement of the spleen ; in all cases discolouration, as in case of the liver.

In four cases there was slight congestion of the kidneys, in one case evidence of fatty degeneration, in all others that organ indicated a healthy condition.

The blood was always very dark coloured, and the muscles pale, coloured and relaxed.

The disease of the lung was in all cases the leading pathological indication, to which all other diseased appearances observed were secondary in importance, constituting complications only.

A section of the lung of an animal slaughtered during the active inflammatory stage of the disease shows, under the microscope, a complete solidification of lung tissue, the air-cells being filled with epithelial exudation, no fibrin or extravasated blood appearing.

A section of the liver from the same animal shows thickening of the septæ acini and a complete destruction of some of the acini by proliferation of epithelial cells, tending to or constituting, fatty degeneration. Other acini in the same section exhibit a perfectly healthy condition.

A section of the intestines from the same animal shows a healthy condition.

The contents of the stomach and intestines were liquid in six cases, and dry, hard and very black in all others.

The gall bladder usually contained a small quantity of thin, greenish fluid.

The bronchial tubes and trachea contained a large quantity of matter, consisting of mucous and broken-down epithelial tissue.

Character of the Disease.

Judging from the visible causes that appear most active in its development, and the symptoms and pathological evidence disclosed, we feel fully warranted in pronouncing the disease, in its milder manifestation, Bronchial Catarrh, and in its most active and fatal form, Catarrhal Pneumonia.

There is no symptom uniformly present in the disease that bears analogy to those of Cholera as affecting the human family, and the term Hog Cholera is, therefore, a misnomer.

While there is ordinarily but little in a name, in this instance misnaming

the disease has been the source of incalculable loss, by suggesting a line of treatment irrationally administered, and calculated to aggravate rather than cure it.

Its Cause.

It is when seeking the causes of this widespread epidemic disease that the field of investigation takes greatest range. As before stated, it prevails more or less at all seasons of the year, and under almost every conceivable condition and combination of conditions, as to soil, water, food, and general management; but there is a marked difference in the prevalence of the disease, under certain circumstances, so uniformly observed, that from these facts we may be able to derive some reliable information as to the conditions most favourable to its development.

The past history of the disease seems to indicate that it originated in this country at the time when the condition of swine was visibly altered form a comparative state of nature to one of more perfect domestication. When the country was new, affording almost unlimited range, the hogs bred, grew up, and roamed in the woods until maturity. Being allowed the free use of their noses, and being omnivorous animals, they fed on worms, roots, mast and such other varieties of food as they could find, or was furnished them by their owners. They exercised as their inclination or necessities inclined them; had free access to numerous springs and streams of running water, and slept in storm-sheltering thickets, on beds of clean leaves, and enjoyed, under these circumstances, a vigour of constitution and an immunity from disease unknown to the modern swine-breeders of the country.

As the country became more densely populated, rendering it necessary to clear and fence the land for agricultural purposes, the lank, active, long-nosed hog of the pioneer age began to disappear in order to give place to a new and more advanced civilization in the history of his race. A close business calculation demonstrated that a hog fed to profit on food the product of manual labour, must have an inbred tendency to lay on flesh, and this tendency encouraged by confinement to limited quarters, and giving an amount of food equal to the highest consumptive capacity of the animal. The hog of to-day is the result of persistent in-breeding for an obese habit, encouraged by want of exercise and over-feeding. An animal quite comely in shape, early in maturity, of strongly developed fattening tendencies, and of enfeebled constitution, is the intelligent and natural result.

An animal thus deprived, in part, of the constitutional vigour of its ancestry, forced to give up the instinctive habits of its race in obedience to the regulations of modern farming, must necessarily have acquired a tendency to disease. If, under these circumstances, in the modern era of hog-raising, the animal is more frequently exposed to disease-producing causes, a general prevalence of disease must be the result. Are there generally present causes operating upon well-known principles of animal physiology, calculated to produce the disease that we have observed? If not, we are forced, in the absence of visible causes, to indulge in hypotheses, and seek for some hidden specific poison which, operating to produce the disease, may thereafter propagate it by contagion. That the disease is epidemic there can be no doubt: that it prevails as a general epidemic over a wide range of country is established beyond controversy. Can the causes operating in its production be equally general in their presence? We will assume that the hog of the present time, as compared with his pioneer ancestor, is an animal of impaired constitution; that his habits, as imposed by the will of the farmer—as to food, water, cleanliness, exercise and rest—do not approach so nearly a strict observance of the laws of health as do the instinctive habits of the animal in an unrestrained state of nature. His habits and opportunities in the latter

state have been briefly alluded to already. What are the altered conditions hat conflict with the laws of health that are imposed in the former state?

Food.—In considering this branch of the inquiry, we will first consider briefly the subject of food. The hog is an omnivorous animal; when he can obtain it he eats both vegetable and animal food; his nature demands and his health requires it. In his natural state he obtains the animal diet from the ground by the industrious use of his nose in digging for worms and insects. The most improved style in modern farming proclaims the nose a useless appendage, and breeds it to the smallest possible size—as a thing of beauty to adorn—a ring. The natural source of supply of animal food is cut off, and the animal compelled to feed almost exclusively on vegetable diet. That this style of feeding, long pursued, is not conducive to the highest state of health would seem self-evident. In the hog-growing districts corn alone is the almost exclusive diet of hogs, from birth to the time of slaughtering, and it is in these districts where the diseases are most prevalent. On the contrary, hogs fed upon hotel and city garbage, in which there is a liberal admixture of both vegetable and animal food, are always most healthful and free from disease.

In the city of New Albany, Ind., there are more hogs to the square yard than are to be found elsewhere in the State. Their rights are held sacred, they roam in any street, sleep in any alley, and break into almost every yard. The average councilman regards them as his minor constituency, and the people have therefore vainly prayed for hog ordinances and hog cholera, and still the animal feeds upon our bounty, multiplies his race, and almost defies disease.

It was observed that a common practice obtains in the White River valley of hauling corn into the fields for convenience in feeding, and placing it in an open rail-pen. The heat and moisture to which it is exposed soon causes it to mould at the cob. All that was examined was more or less damaged and unfit for use as an article of food.

Water.—During the dry months of the fall season it seldom occurs that hogs have a bountiful supply of pure water, even in well-watered localities. The small streams run exceedingly low, and a scant supply of pure water is the usual condition of that season. In all the herds examined, where the disease prevailed, in but two instances was a proper supply of water observed. In a large number of cases there was absolutely no water, only thin mud, at the watering-place. At Mr. Quinn's farm, near Hartsville, Ind., where the disease was prevailing, twelve head of sick animals were running at large in a field of eight acres. When asked concerning the supply of water he said there was plenty—"a good spring." On personal examination I found the spring issued from a hill-side with but little incline. From where the spring issued to the point where the stream disappeared from exhaustion, a distance of some forty feet, there was a long bed of thin mud—no visible appearance of running water at any point. The proprietor was asked, on our return from the spring, when he had last inspected the watering-place. He replied, "this morning." He was then asked if he thought the water furnished by that spring would supply a few head of cattle, or horses, or other stock with suitable water; he replied promptly, "no." He was then asked by what process of reasoning he arrived at the conclusion that water of acknowledged unfitness for any other kind of live stock, was quite good for hogs, and sick ones at that? His reply, in substance, was that hogs would not use water until they had rendered it unfit for anything else. This case is mentioned in detail because of its representing the view taken by the average farmer upon the subject of water for hogs; that any kind of water, however muddy and stagnant, is good enough for them.

Cleanliness.—The domesticated hog does not approximate the habits of his

pioneer ancestor in point of cleanliness. It is the instinctive habit of the animal to bathe in water and wallow in the mud, during the heated term particularly. The first act, to counteract excessive heat: the second, to protect himself by a coat of mud from the pestilent flies; but in the state of nature, while running in the woods, when the dirt has served its purpose he immediately cleanses himself thoroughly by friction with the nearest tree. The filthy bed which the animal becomes satisfied to occupy in a state of confinement is never found occupied by hogs running in the woods, and given opportunity to provide and change their sleeping-place at will. The high points, cool and dry, are selected for summer resorts, while south hlll-sides are given the preference in the winter season. In short, when allowed to provide for his own existence he exercises a more intelligent regard for his wants than is ordinarily exercised for him by his more intelligent overseer, who attempts to supersede instinct by reason. The frequent allusions made to the native hog may provoke the inquiry, shall we return to the ungainly and ill-shaped animal of forty years ago? Certainly not. In this age of high-priced corn, he would be unworthy of an existence; the only thing to be admired of him is his health and constitution; the only useful lessons to be derived from allusions to his history, is the means by which they were acquired and maintained. Food, faulty in character and wanting in variety; water, deficient in quality and purity; quarters too limited in space and filthy in condition, are the three leading factors in the production of the disease of swine.

Special attention was given to the examination of the character of the land occupied by sick animals, and while there were exceptional cases, in a large majority it was observed that they were running in fields producing quite a luxuriant growth of weeds, at that season shedding their bloom, seed and leaves; the earth was exceedingly dry and dusty. In travelling about the animal created a dust from the earth with his feet, and shaking the weeds, caused the dried particles, being exfoliated, to fall from them; these two foreign substances were taken into the air passages and lungs with the air, and constituted an active source of irritation. While prosecuting this branch of inquiry we were informed by several intelligent observers that they had discovered that wheat and rye stubble were the places most injurious to the health of hogs, and that when running in such fields they were more prone to disease than elsewhere. The testimony of others, and our own observation, confirms, that it is during the dry fall season that the disease is most prevalent and fatal. It is at this particular season that hogs are most neglected. Having been turned to grass and clover, and allowed to shift for themselves, they prosper and thrive during the summer without attention; but at the commencement of the dry months there is a sudden drying up of the grasses and failure in the water. The green grass and clover, full of nutriment, give place to that which is mature and dried up, in which state it is indigestible and constipating. It is also at this season that the animal keeps his skin most foul with mud as a protection against flies—materially interfering with its healthy functions as an auxiliary to the lungs and other depurating organs. This is the season in which the cool nights precipitate a heavy dew, and while running through grass and weeds wet with this cold dew, the animal becomes chilled during the morning hours, to be dried off and scorched with burning heat at each returning noon-day. During the night and early morning the animal is chilled, sending the blood from the surface to the central organs of the body, and breathes a cold, damp atmosphere; and during the heat of the day he is exposed to a high temperature of dry heat, and breathes an atmosphere ladened with dust, sand, and minute particles of decayed vegetation falling from the weeds; his bowels have become constipated from feeding on dry grass, and his secretions generally deficient. Are not these a strong combination of circumstances well calculated to develop catarrhal

affections, and do they not exist during the period of the year alluded to in all localities, as general as the prevalence of the disease itself. It may be objected that certain exceptional cases occur in which many of the conditions named do not exist, and still the disease prevails. The same objection would come against any possible theory of its cause. As before stated, the disease prevails again most extensively during the months of February and March. This is the season when bronchial and lung diseases are prevalent, in the human subject, due to atmospherical change and exposure to the damp earth in a state of alternate freezing and thawing at that season.

Swine are similarly affected during this period from the same causes, and being more generally exposed to these causes than man, are liable to disease in an epidemic form.

The objection to this rational theory of the disease is, that it is found to exist at other seasons of the year, and under circumstances when almost all the conditions above mentioned are absent and wanting. That it is observed under such circumstances is unquestionably true. In a few instances we observed it where there was no want of first-class care in their management, as to food, water, cleanliness, and shelter; and where the animals were ranging in clean blue grass pastures, protected from heat by beautiful groves; but the prevalence of disease under such circumstances was of extremely rare occurrence.

It is the predominant opinion among farmers that the disease is due to some specific poison or contagious principle existing in the atmosphere; but this theory is maintained under difficulties equally as great as those applying to the former view.

We found the contagion theory generally entertained by the farmers of Putnam county, where the disease prevailed this season for the first time as a general and widespread epidemic. Many claimed that it was communicated by a diseased lot of animals driven through that county from the county of Boone, but many cases occurred on farms remotely situated from the route travelled by the drove of sick animals, and isolated from public highways, and upon which farms no new or strange animals had been introduced, by purchase or otherwise.

A toll-gate keeper on the turnpike near the village of Bainbridge, in that county, had a few animals running at large, and coming in contact with all the animals passing over the road; they escaped the disease, while others occupying enclosures had it. Numerous instances were reported by intelligent and reliable men, where the disease prevailed upon a farm, with but a partition fence separating the animals sick from those of an adjoining neighbour, and the latter entirely escaped the disorder. There seemed to be a general exception to this in all cases where a stream of running water passed from the diseased enclosure into the one not previously affected, which would indicate that while the disease may not be strictly contagious, it is capable of communication from the secretions of sick animals coming in actual contact with those not before affected, as is the case with almost all infectious diseases.

Experimental tests made in pursuit of this branch of the subject demonstrated that the introduction of diseased matter into the system of healthy animals, by inoculation, generally, but not invariably, produced the disease; but in the cures where disease followed inoculation, there was no assurance that the animal was perfectly sound, and would not have been the subject of the disease if the operation had not been performed. It is a safe practice, however, to separate the well animals from the sick, at the approach of the very first symptoms of the disorder—a rule that applies with equal force in regard to all kinds of live stock, when threatened with any kind of disease.

The eating of the flesh of the dead by the surviving animals should always

be prevented by prompt removal and burial or cremation, although some farmers claim that by pursuing the opposite course their sick have apparently made better recovery—a circumstance, if correctly observed, only demonstrating that the herd was suffering from want of animal food to such extent that when furnished in a state of disease it actually does more good than harm. Those who hold to the theory of contagion generally agree upon from twelve to fifteen days as the period of incubation. Mr. William B. Taylor, of Martinsville, Indiana, a gentleman of large experience as a feeder and packer, and a close and intelligent observer of the disease, states that when a herd of diseased animals are turned into a field with other animals not previously exposed, the disease will usually run through the entire diseased herd before attacking the other animals; and Mr. Joseph Goss, of Gosport, Indiana, who has been engaged in feeding and packing for twenty years, and who is a most intelligent observer, confirms the observations of Mr. Taylor.

The Disease as Affecting different Breeds.

This branch of the subject was forced upon our attention by parties who claimed, in behalf of certain breeds, a partial or complete immunity from the disease. Unfortunately, our opportunities for observation in this regard were not good, since all the animals we saw were grades in which the Berkshire and Poland China blood largely predominated. The best information gained upon this subject was to the effect that all breeds for which immunity was claimed were those not in general use, and that the absence of loss from such breeds was due to the smaller number of such animals existing in the diseased districts. Such claims were made in behalf of the Chester Whites and Red Jerseys; we saw none of either breed in our travel, sick or well. Possibly the Jersey Reds may escape the disease for one or two generations better than other breeds, from these considerations: They have been quite recently introduced in the West, and are an Eastern bred animal, developed in a section where the practice of inbreeding, overfeeding and close confinement does not prevail to the same extent as among Western breeders, and probably have, therefore, a more vigorous constitution, better enabling them to resist diseased tendencies.

The Recurrence of the Disease.

All experienced feeders agree in the opinion that animals that recover seldom have it a second time, and state that in purchasing animals to feed they always prefer such as have gone through the epidemic.

We are inclined to accept this opinion as of little consequence, for the reason that such as are fed for pork do not afford a sufficient lapse of time to clearly demonstrate this point; and, on the contrary, among breeding animals that are allowed to live older, in which timely opportunity is given, our information is that a second attack is not an infrequent occurrence.

Effect of the Disease on Breeding Animals.

Females having the disease while breeding almost invariably cast their young. If they escape that accident, their offspring usually die soon after farrowing. Subsequent litters, born after the female has entirely recovered from the disease, are equally vigorous with the produce of such as have not had it, and do not exhibit any more aptitude for the disease. The opinion obtains, however, that the male is more seriously affected by the disease, and, after recovery from it, is seldom a vigorous and reliable breeder.

Prevention of the Disease.

The widespread prevalence of the disease, its rapid course and dreadful fatality, fully warrant the opinion that measures of prevention, if discovered and applied, will be more beneficial in their results than the discovery of a

successful line of treatment, unless that treatment shall consist of some specific remedy, a practicable use of which in the hands of the farmer can be made during all stages and modifications of the disease. That such a remedy will be discovered, in our opinion, is not within the range of probability. The measures necessary to prevent disease in domestic animals embrace within their range a careful study of their natural habits and wants, and a strict observance of the general laws of health that govern all animal life, the principles of which are the same in application to inferior animals as to the human race.

Those errors alluded to when considering the cause of the disease as, in our opinion, largely contributing to, if not wholly the cause of its production, must be corrected. The idea that swine are exempt from the ordinary laws of health and disease, and will thrive under almost any condition in life, must be abandoned. Forced to keep pace in his improved development with the advance of the age in which he lives, he requires additional care in his management in order to ward off the numerous ills to which he is liable, many of which are unknown to his race in its unimproved, natural state. The food should consist of as great a variety as possible to supply ; the water drank should be pure ; too many animals should not be herded together : the small animals kept separate from the mature ones ; frequent change from one inclosure to another ; the breaking-up of sleeping places when they become filthy ; they should be strictly observed at the approach of dry fall months, and upon the drying up of the grass, laxative food, as bran mash, or aperient medicine, as soap-suds. Glauber salts or linseed oil given to counteract the constipating effect of dry grass ; the watering places daily inspected ; they should be taken out of the grass and weeds during the night and early morning hours to avoid the dew, and at all times be kept from fields producing weeds, particularly during the season of exfoliation. When confined in close pens, these pens should be daily cleansed by a removal of excrement, and dry earth or copperas, or chlorinated lime used as a disinfectant. The opinion that corn alone contains all the elements of food necessary to the growth and development of swine, is an error that the average farmer will never abandon until taught many costly lessons by experience when attempting to freight his corn crop to market through this uncertain and risky medium of transportation. A judicious and intelligent system of inbreeding cannot be discontinued without reverting back rapidly to the ill-shapen animal of other years ; and we do not insist that the practice of this system, when intelligently and judiciously followed, is deteriorating to the health of the animal ; the practice is only injurious when animals nearly related, having the same defect in constitution and aptitude for disease, are coupled and multiply those defects and aptitudes. Inbreeding occurs among all animals in their natural state, but its bad effects are warded off in great measure by the more vigorous males conquering or destroying the weaker ones, and thereby becoming the sires of the offsprings of the females—thus nature provides for the "survival of the fittest." In artificial inbreeding, considerations as to desirable shapes too often outweigh those relating to the constitutional vigour and health of the animal selected for breeding purposes. Good feeding is the counterpart of good breeding, but there is a marked difference between good feeding and overfeeding or stuffing ; good feeding consists in giving at all times, at regular stated intervals, an amount of proper food to meet the demands of the system for full repairs in waste, and an excess only sufficient to promote the immature growth of the animal ; while overfeeding consists in pushing the amount to the fullest assimilative capacity of the animal with a view to obtain the greatest possible amount of excessive flesh. One is essential to good breeding, the other deteriorating to the constitutional vigour of the animal.

TREATMENT.

So much time was consumed in considering the more practical branch of the investigation that the remaining time allowed in which to conduct the experimental branch of the inquiry was too limited to afford complete opportunity to arrive at any definite results as to cure. In fact, the entire time allowed for the investigation seems insufficient to the proper conducting of a series of differential experiments as to treatment, by which alone any certain and well ascertained facts can be discovered and established. The publication of the names of the members of the commission appointed to conduct this investigation brought to our notice a large number of so-called hog-cholera cures, whose proprietors asked us to test or allow them to test in our presence. These applications were always coupled with a condition, that in case the remedy proved a cure we should give the proprietor the benefit of an official endorsement of their remedies—they not proposing to make known its component parts. Their object being to promote their private interests, we did not regard the investigation of their private remedies as coming within the range of the duties imposed upon a commission appointed to conduct an investigation at the public expense for the public good, and hence we declined to answer all such applications. As conclusive that no grand discovery has been left in obscurity by such action on our part, we will say that in our travel and intercourse with farmers, no one was found who claimed in behalf of any so-called cure any merits as a remedy for the disease, except in two cases only, where the parties were local agents for the sale of the remedy in behalf of which such claim was made.

The herd of Mr. Quinn, near Hartsville, Ind., of which previous mention was made, was selected as well located, and presenting the disease in the proper stage for experiments as to cure.

The sick animals were confined to proper limits in a small pen, well located as to comfort and health. Having the disease in its first stage, and free from vomiting and purgation, they were given a purgative dose of Glauber salts; after which they were given a solution of bromide ammonia in doses of thirty grains three times per day. This remedy was tested at the suggestion of the department. The food consisted of milk and millfeed.

The animal exhibited great repugnance to taking either food or medicine, but both were enforced as well as practicable, but the result was that little or no effect was observed as due to the treatment administered, the animals dying in about the same proportion as others not treated at all. The animals observed to have the disease everywhere were in the main half-grown shoats and young pigs, and the loss by death was about ninety per cent.

A herd of seven head belonging to Mr. Stodder, of Bartholomew county, were similarly treated with similar results. A herd of five head of animals belonging to Mr. Thomas, of Harrison county, were treated, in which crude antimony in doses of ten grains was given during the inflammatory stage of the disease with no visible curative effects. Many isolated cases were treated by other parties under our direction, in which special effort and pains were taken by treatment, in which linseed oil was used as a purgative, and antimonials as a sedative during the formative and inflammatory stage, followed with tonics in the third stage, but the results under all the various plans were the same—the animals dying in about the same ratio or per cent. Candour compels the admission that in this branch of the inquiry our research was wanting in breadth and extent, and, so far as made, without efficient results.

STABLE MANAGEMENT OF TROOP HORSES IN INDIA.*

By Richard Poyser, F.R.C.V.S. (The Carabineers), Umballa, India.

In dealing with the above comprehensive question, it is not proposed to lay down a *régime* for any one station, province, or presidency, but to record observations and suggestions which, whilst of practical value, shall apply to the country as a whole, founding them on deductions drawn from a lengthened experience and practice, both curative and preventive, over a period of nearly ten years in Bengal, the North-West Provinces, and the Punjab, on the North-West Frontier and in the Province of Oudh.

The happiest results may be expected to accrue where the system of stable management is based on common sense, experience and science ; and where there is unity of purpose and action, with a desire and determination in each administrative and executive agent to do his own duty thoroughly and confine himself to it, there will be little or no cause for complaint ; whilst a system biassed by custom, trammelled by prejudice, and perverted by inexperience and interference, must, as a matter of course, be attended with indifferent—nay, disastrous results. Of negligence and want of supervision we have nothing to say, excepting that they should not be conspicuous by their presence ; a partial or entire co-existence of such influences is very undesirable. Differences of opinion, and misconceptions of duty, will occasionally run riot in the "best regulated" troop stables, and it is much to be deplored that the management of horses in health, and their treatment in disease, should now and then give rise to controversy.

With this preliminary, we start by asserting that *Stables are essential to the well-being of horses, troop or otherwise, in India.* This being an incontrovertible fact, reasonable expense should not be spared in designing and constructing buildings that shall at once be suitable, durable, economical (in the long run), readily influenced by sanitary measures, and even portable.

The conversion and improvement of old stables will not be considered here, as individual cases must of necessity be separately met and disposed of.

Many troop horses have been lost to the service, temporarily and permanently, from want of protection from inclemencies of weather, climate and insectile annoyance. Our troop horses are only sheltered overhead : they are insufficiently protected from the prejudicial influences of hot, cold, dry or damp winds and draughts, from the sun, drifting rain, and dust. Of course some troop stables are vastly superior to others, but none are protective enough at all times and under all circumstances : they meet few exigencies of the hot, and fewer of the cold, season.

It is argued that exposure, or living in the open, inures horses to the hardships of marching and manœuvre, campaigning and camp life generally ; but this argument is almost unsupported, and is rendered untenable when we reflect that the above conditions of the troopers' existence are quite exceptional, and that it would be but feeble policy to direct our actions by events which are *not* the rule.

The more care that is taken—short of pampering—of the horses that are bound to be kept up on a peace establishment, the more prepared will they be when required for opposite emergencies, and the public exchequer will be none the more taxed eventually.

Analogically reasoning, *we* do not lead lives of exposure from choice, nor is it found compatible either with reason, health, or the country's interest to permit our soldiers to do so, just because there is the chance of an annual march or manœuvre, or a campaign once in twenty years : the contrary course

* This is the essay which gained the first of the prizes recently offered by Mr. F. F. Collins, Principal Veterinary Surgeon, Bengal.

is signally observed, and the contingencies and hardships of camp and war are put up with cheerfully enough when they do arise, and endured none the less stanchly. So with our horses. Give them plenty of space and air, adequate shelter and protection, good food and water, and a sufficiency of both, regular and not too little exercise; insist on good grooming and scrupulous cleanliness and sanitation, and then there will be nothing to fear whenever they are called upon to act beyond the ordinary routine of cantonment life.

With one or two exceptions, the horses of British artillery and cavalry are stabled; but the reverse is the case with Native cavalry, and for that we can see no very valid reason. It is, however, to be remarked that the horses of the latter corps stand the climate of India better, being mostly indigenous, than the imported ones (Walers), which are now, more than ever, filling the ranks of the former corps, though not better than our stud-breds and the other imported ones, Arabs and Persians. These two latter come very nearly under the head of indigenous. It is also true that the Sowar's horse costs, or used to cost (times and prices are fast changing) about three times less than that of a British corps; but then it was purchased from a source but little patronized by Government, and, it may be said, monopolized by the Native cavalry. This it has now lost, and is not only giving higher prices, but crying out that soon it will not know how or where to remount itself. Hitherto Government has had no very direct or apparent responsibility in the native trooper's allotment, feeding, well-being or diseases, unless in the case of horses attacked by Glanders or Farcy, when a limited compensation is allowed.

It is to be inferred that as this class of horse becomes dearer, so will arise the necessity of providing stabling for the more expensive article. Notwithstanding his exposure, however, to all kinds and vicissitudes of work and climate, he compares very favourably with our own troopers in many ways, because the Sowar has a monetary interest invested in his mount, and this implies the observance of more than ordinary personal care.

Many of the Indian troop stables should be entirely demolished, and new ones built on virgin ground where practicable; as an instance of some of the worst, we could mention those of Meerut and Peshawur. The former are merely low, flat-roofed, and narrow bullock sheds, the latter rude shelter sheds, hemmed closely in on three sides, and huddled into an inadequate space.

There are few troop stables and lines that are not over-crowded, and one of their greatest faults is the want of superficial and cubic space. There must be an abundance of both to obviate crowding, than which, with ill-ventilation, nothing militates more against the health and utility of horses, or aids more in filling the hospital. The stables are neither deep enough to afford protection from sun and rain, nor are they wide enough per stall to ensure comfort. The central passages are too narrow, the roofs of most are too low, and badly or not at all ventilated. The ranges are too near each other, and the entire blocks are in many places so hemmed in by trees, human and other habitations, offices, workshops, saddle and harness rooms, gunsheds, urinals, "rears," etc., that ventilation is seriously impeded and thorough drainage interfered with, thereby favouring the development of diseases and enhancing their dissemination. Several or many of these defects, if not all, are noticeable wherever British mounted corps are quartered, and they exist in a greater degree in most native cavalry lines.

The close proximity of stables to human dwellings is neither good nor healthy for the occupants of either in any climate or country, and therefore this needless huddling together of animal life should be studiously avoided, and corrected where existing; for in India there should be no feasible excuse of want of ground.

The worst description of troop stable in England is that over which troops live. It is warmer in winter, but more stuffy, hot, and objectionable in summer than that *best* of all stables which is *open to the roof*, and having ridge or roof ventilation. The warmth of stables under troop rooms, and the horses' finer coats, are maintained at the expense of free ventilation, which cannot be very well arranged to provide due convenience to the residents above or below.

In India, though there is no difficulty of this kind to contend against, it is very remarkable that there still exist pitched roofed stables, with but little ridge or roof ventilation, or none at all. It is with the position, proximity, and character generally of the surroundings of our troop stables that we find fault, as well as with the disposition and construction of the stables themselves, all of which will meet with full and minute consideration as we proceed.

With few exceptions Indian troop stables are too clumsily built; the pillars are generally too bulky and numerous; the end walls are not sufficiently ventilated, or ventilated too much.

They might be open above a dwarf wall of six or seven feet, or if the walls be continued to the roof, to counterbalance wind-pressure, they should be constructed by omitting alternate bricks above the height named.

The stable required is one that provides shelter from a tropical sun and monsoon rains; affords ample standing room; admits an adundance of fresh air; mitigates the force of hot winds; subdues the intensity of solar light, and thwarts or prevents the attack and annoyance of flies and other biting or stinging insects; gives speedy and sure exit by its spaciousness and ample ridge ventilation to the products of exhalation and respiration, to the foul emanations arising from excrementitious matter, whose decomposition and fermentation are accelerated by the high temperature; whilst it should be so constructed and arranged as to protect the horses from the cutting winds, draughts and cold of winter (or the cold season). The seasons of the plains of India, for which it is necessary to make these various provisions, are divisible into *hot* and *cold*, each bringing its own special and inseparable climatic vicissitudes; for instance, hot, dry, and scorching atmospheric rarefaction, with or without wind; heat and moisture without aerial movement; a lower temperature with wind often charged with moisture and miasmata,—all conditions more or less oppressive and enervating to animal life. Then we have cold dry, piercing and searching in its character, cold with dew, fog (to a limited extent in some parts), with or without winds and chilling rain, very cold nights (hottish days), and frost (and occasionally hail) in Upper Bengal, increasing in severity and lasting longer to the northward.

Hitherto, the apparent object in constructing stables has been to afford shelter against vertical solar rays and non-drifting rain, or to *feebly* meet the exigencies of the hot season. Heat is not the *only* climatic power against whose baneful effect horses must, if possible, be protected. It is high time this error was corrected. The bracing and re-invigorating effects of cold on the system are well-known facts, but cold ceases to act beneficially when the degree of chilliness or shivering is reached: then it loses its tonic influence and becomes depressing to vitality, and is dangerous when long continued, draughty or accompanied by rain. Draughts are to be avoided or the open picketting is preferable.

Cold acting on a vast surface like a horse's skin, will destroy functional equilibrium, not only in that organ, but in organs that are more or less vicarious to it, not excluding those of the digestive system; a congestive condition is set up, defective secretions are induced, or functions are more or less suspended and active disease supervenes. This is what is generally understood by the result of a *chill*. The remote influence of cold artificially produced

by the wind blowing on a horse's skin that is freely perspiring is often observed in the hot, dry season, on the throat and nasal chambers, causing an irritable cough, and frequently extensive mucoid defluxion from the nose. Examples of passive hyperæmia—the dark purplish or leaden discoloration—of the membranes of the nostrils may be seen in the early mornings, when the cold is most searching, before the sun has warmed the air, or exercise or warm clothing has removed the condition.

The evil effects of colds on horses, whether it results from atmospheric disturbances, such as dust storms or the monsoon rains, which are often accompanied with much wind—whether it exists as the constant condition of the cold season, its severity being at the maximum during the night and just before sunrise, no matter how or from what quarter engendered—must be cautiously watched and methodically guarded against. Less danger arises (to horses) from exposure to heat than to cold, and from the influence of either condition, shelter overhead is better than none at all, provided there are no counter-influences in the way of bad ventilation and mal-sanitation; yet, when we use this same stable to meet the exigencies of the hot season, and then expect it to suffice for those of a Punjab of North-West cold season, without making other provision against cold draught, wind and rain than that which a couple of country blankets can give, we fail most signally at the outset of our stable management.

Warmth is as necessary to keep a horse in health, condition and bloom as it is to us. Troop horses would be much better off in the open if they were well clothed in winter, than in many of those draught-creating fever and colic-producing buildings, yclept stables (except perhaps during rain). Their very construction renders them nothing more nor less than a series of draughty passages. When a building is neither suitable for the hot nor the cold season, it cannot be considered a very satisfactory dwelling for horses; and we can hardly hope to construct stables that will be, without periodical alterations and additions, in a climate having so many variations of character and extremes of temperature. A new and remodelled class of stable is desirable, whilst the conversion of old ones calls for careful attention. We shall not deal with the latter, but describe plans in detail of the former calculated to approximate the desiderata expected, to withstand wear and tear, seasons and the test of time, and to furnish unquestionable advantages to our troop horses, and *eventually* to the public purse; but economy at the outset must not be too much considered, but will assuredly come with the future.

(To be continued.)

CHRONIC MULTIPLE PERIBRONCHITIS IN THE HORSE.

IN the early numbers of the *Wochenschrift für Thierheilkunde* for this year, Professor Dieckerhoff, of the Berlin Veterinary School, publishes an important communication he made to the Veterinary Society in that city, relative to the difficulties which attend the diagnosis of Glanders, and especially in determining whether certain morbid processes should or should not be considered as glanderous in their nature. After pointing out the essential characteristics of Glanders, he draws attention to what he describes as Chronic and Idiopathic Peribronchitis—a condition which will be identified in this country as the Phthisis described by some veterinarians as occurring in the horse.

Dieckerhoff says that in the course of the disease, nodosities are formed on the walls of the bronchules, varying in size from that of a millet-seed to a

pea. At first these pathological productions offer, on section, a certain degree of resistance and density, as well as a shining appearance; later, however, this appearance is lost, and the nodules assume a greyish-white colour—become, in fact, fibro-caseous. Some of the nodules are situated at the side of the bronchules; others surround them, and each of these has in its centre the canal of a minute air-tube, obliterated, as it were, by a plug of mucus. The adjacent pulmonary tissue is healthy, and perfectly crepitant. At a later period the cells composing these little masses undergo a degenerative process which transforms them into a dry greyish-white *détritus*, while the outline of the nodules appears more or less irregular and angular when looked at on a surface-section of the lung. The final transformation these neoformations assume is that of calcification, though it would seem that the nodules may exist a very long time, perhaps for years, without undergoing this transformation, which, after all, Dieckerhoff had rarely witnessed. All the horses in which he had observed these lesions had them in both lungs, though more frequently one was more affected than the other; sometimes they were enormous in quantity.

Among the different varieties of *Peribronchitis Chronica* described by the principal authorities in anatom-pathological science, and who have occupied themselves with this disease in mankind, that (see Buhl, "Lungenentzundung, Tuberculose und Schwindsucht," 1873) which they have described under the name of *Peribronchitis Nodosa* offers the greatest resemblance to the alteration studied by Dieckerhoff. He is therefore disposed to accept this designation for the disease in the equine species, though he is aware that certain writers consider *Peribronchitis Nodosa* as a form of Tuberculosis; but in the horse at least it has no relationship with the latter.

With regard to the existence of an idiopathic *Purulent Peribronchitis* in the horse, Dieckerhoff had not sufficient evidence before him to decide upon. Before the important researches of Virchow were made known, the Chronic Peribronchitis of man was generally considered as tuberculous in its nature, and the Berlin professor thinks the pulmonary affection described by veterinary writers under the name of *Tuberculosis of the Lung* might be nothing more or less than a *Chronic Multiple Peribronchitis;* at any rate, Dieckerhoff had never met with Miliary Tuberculosis in the horse. The three examples of multiple nodular formation observed by Pflug ("Zur Pathologischen Zootomie des Lungenrotzes der Pferde," 1877) were probably only cases of Peribronchitis.

Dieckerhoff could not furnish any evidence with regard to the causes of this *Peribronchitis Nodosa* of the horse. But the disease being seated in the bronchial capillaries, together with the multiplicity of centres, as well as these being apparently all of the same age, led to the supposition that some atmospheric influence, which had only acted once on the patient, was perhaps the cause of the lesions. This, however, is given as even less than a hypothesis, as there were no certain facts to support it.

One interesting remark made by the professor is, that never to his knowledge had the presence of the multiple nodosities caused any derangement in the health of the horses so affected; on every occasion on which they were observed there were secondary lesions. If, *a priori*, an opinion was sought, Dierckerhoff would be inclined to say that this condition would give rise to certain kinds of "broken wind," especially as certain medical authorities think that this lesion produces obliteration of the alveolæ and bronchules. The professor would not go so far as to assert that "broken wind" was really due to this condition, though it might be so in certain instances. In three cases which were under observation for several weeks, and which exhibited no symptoms of dyspnœa, a great number of nodosities were found in both lungs after death. The entire absence of any respiratory disturbance in

these cases, is explained by the fact that the pulmonary parenchyma was not involved.

With regard to prognosis, Dieckerhoff considers this condition as merely an unimportant anomaly. But, on the contrary, its importance with regard to a differential diagnosis with Glanders is very great. It is of much moment to know that *Peribronchitis Chronica Nodosa* may be present in the horse, and be mistaken for Glanders.

The most important feature in differentiating the lesions of the two maladies is to be found in the fact that in Pulmonary Glanders the nodules are in general of different ages, and particularly that those of recent date show on section a large degree of vascular redness. If it exceptionally happens that greyish-white or calcareous Glander nodules are not found in the lungs, there are at least other pathological lesions which allow a diagnosis to be arrived at, and these are to be met with either in the respiratory mucous membrane or in other organs.

In any case, if the lungs are alone the seat of numerous small greyish-white nodules possessing somewhat similar characters to those of Glanders, and if a careful examination of other organs does not lead to the discovery of any evidence of that disease, there is ample reason to conclude that the nodules are due to a benignant Chronic Multiple Peribronchitis, and that suspicion of Glanders is not justifiable.

AN EPIZOÖTY AMONG LARGE GAME AND CATTLE AT MUNICH IN 1878.

DURING last year, we on several occasions alluded to an outbreak of disease then prevalent in the summer among large game and cattle in the neighbourhood of Munich, which, in most of its characters, resembled Anthrax; and we mentioned that Professor Bollinger, of the Munich Veterinary School, was investigating the malady. The Professor has published the result of his researches in a pamphlet entitled "Ueber eine neue Wild-und Rinderseuche welche im Sommer, 1878, in der Umgebung von München beobachtetwurde;" and as they are more than usually interesting, from the fact that a similar epizoöty—very fatal in its effects—reigned among deer in this country, we give a *resumé* of his labours.

The disorder attacked deer and wild boar, and was transmitted from them to cattle. The period of incubation was very brief—only a few hours,—and the course of the disease extremely rapid—its duration being in general twelve, twenty-four, or thirty-six hours, rarely more than three days. So far as could be discovered, no sick deer or boar ever recovered. The autopsy of dead animal revealed the existence of Croupal or Fibrinous Pneumonia, Pleurisy, Pericarditis, Mediastinitis—all of which constituted the pectoral form of the disease, and assimilated it to a contagious Pleuro-pneumonia. In other instances, there was Erysipelas with inflammatory Œdema, constituting the exanthematic form of the disease—a kind of contagious Erysipelas.

When the disease assumed the pectoral or thoracic form, the lesions were analogous to those met with in Croupal Pneumonia of man and the Pleuro-pneumonia of cattle. Fibro-serous and cellulo-fibrinous exudations were found in the serous cavities; the blood did not exhibit any indications of alteration; there were sub-pleural, as well as sub-pericardial ecchymoses, while the intestinal canal presented the alterations met with in Enteritis.

A microscopical examination of the blood revealed the presence of Bacteria, though these were suspected to be developed after death. However, rabbits inoculated with fresh blood died within six to eight hours, and sheep and

goats in thirty-six hours. Nothing very noteworthy was discovered in these animals after death.

In the bovine species, the disease was observed either in the exanthematic or the pectoral form. In both forms there was found a hæmorrhagic inflammation of the small intestine after death ; but in the exanthematic there was inflammatory Œdema around the head and face, and more especially about the throat and between the branches of the lower jaw, as well as at the lower part of the neck. This Œdema appeared in from six to twelve hours, the skin, with the subcutaneous connective tissue, attaining a great thickness during that period, while the slightest manipulation caused extreme pain. This tumefaction was due to a serous or sero-hæmorrhagic exudation diffused throughout all the soft textures of the head. When the disease assumed the pectoral form, at the autopsy were found the lesions above-mentioned—Croupal Pneumonia, Pleuritis, and Pericarditis, in different degrees. Some bovines recovered.

A bull, eighteen months old, which had ingested, along with its fodder, two grammes of the sanguinolent fluid from the intestine of an animal which had perished of the disease in the exanthematic form, died fifty-four hours afterwards. At the autopsy the lesions of Pleuro-pneumonia were found. A hog inoculated with some drops of blood from an animal which had succumbed to the malady in the pectoral form, was quickly attacked with acute Erysipelas and died in twelve hours. A cow, also inoculated, soon presented an extraordinary tumefaction at the seat of inoculation, and died thirty hours afterwards.

Bollinger, in commenting on the results of these experiments, concludes that the two forms of the epizoöty are produced by the same cause or causes, and that the exanthematic form may give rise to the pectoral, just as the pectoral form may produce the exanthematic.

He is of opinion that the epizoöty prevailing among the cattle, as also that affecting the large game, was due to the same virus. A minimum quantity of virulent matter, when inoculated, was sufficient to produce the disease, which could then be propagated by the sale of the flesh of animals slaughtered for food, as well as by the sting of wasps and flies.

Bollinger thinks the disease is not exactly Anthrax, and that it differs from it in its nature ; though he admits that it is an *infectious* disease of a peculiar character, and hitherto unrecognised, but as to the extremely acute and nearly always fatal tendency of which there could be no doubt. He notes that in the animals which had succumbed, he did not find that specific colouration so characteristic of Anthrax blood ; neither did the blood contain Bacteria, and there was no enlargement of the spleen.

With inoculated animals the characteristic Anthrax Bacteria were never discovered, and the malady was more rapid in its course than Anthrax. He was therefore inclined to think that the disease, which had manifested itself before 1878, had been confounded with the different forms of Anthrax, and described as such.

There was no instance of transmission of the disorder to people who had consumed the flesh of diseased animals, nor yet among those who had flayed and cut them up, even when they had wounds on their hands. Yet it happened that a labourer who was at work in the vicinity of a deer which had died, was bitten by a fly, and presented the general symptoms of the affection ; these, however, disappeared in about eight days. Looking upon the outbreak from this point of view, he considered there was no occasion to resort to the sanitary measures in force for the suppression of Anthrax.

In conclusion, Bollinger states that the epizoöty which prevailed during the summer of 1878 among large game and cattle was a new contagious disease, which first manifested itself among deer and wild boars, and from

them spread to cattle. The malady had some analogies to Anthrax and Contagious Erysipelas, and assumed the pectoral and exanthematic forms, but in both there was hæmorrhagic inflammation of the intestine. The disease could be propagated by contact and inoculation. The virus resided in every part of the body, and its propagation was endogenous—for there was nothing to prove that it was ectogenous. The cause was undoubtedly the presence of a fungus in the blood. The transmission of the disease to mankind is not certain, but it could be readily produced in sheep, goats, and horses (two instances are recorded in the latter species), and especially rabbits, by inoculation.

NEURALGIA OF THE TRIGEMINAL OR TRIFACIAL NERVE IN A HORSE.

THE existence of Neuralgia in the lower animals is most difficult to diagnose, and though there is no reason to doubt that in some of them it may frequently occur, yet in English veterinary literature it is not described, so far as we are aware. Recently we communicated an instance—unique, we believe,—occurring in an animal under observation, of what was probably *Tic doloreux*, to Mr. Hill, who has published it in his work on the dog. Continental veterinarians have enumerated Femoro-popliteal Neuralgia or *Sciatica*, Cervico-brachial Neuralgia, Dorso-intercostal Neuralgia, Lumbo-abdominal Neuralgia, Mammary Neuralgia, and Neuralgia of the Testicles, as well as Trifacial Neuralgia; but with the exception mentioned as occurring in our experience, neither of these forms have been described by English veterinarians.

In *Tic doloreux*, as observed in the horse by foreign veterinary surgeons, there has been a kind of symptomatic Ophthalmia, with conjunctival redness, lachrymation and photophobia, slight nasal discharge and ptyalism, accompanying the Neuralgia; as well as, in some instances, marked muscular contractions on the affected side of the face. Renner appears to have been fortunate in finding opportunities for studying the disorder; and he states that the eyes are fixed and sparkling, ears moved and thrown back as if the horse were vicious, the head is sometimes twisted round towards the neck, and at times a scream of pain is emitted like that which attends the application of the twitch in some animals; in other instances the horse kicks, paws, or rears. The attacks are usually periodical; and Renner avers that the presence of a man will sometimes check the external manifestations of the disorder, the horse being afraid of a beating. Ulrich, of Breslau, describes a case of *Tic doloreux* in which the condition named "immobility," or staggers supervened.

A recent instance, and perhaps one of the best-observed cases of Facial Neuralgia, is recorded by M. Mathieu, of Opheylissem, in the Report on the Sanitary Condition of the Domestic Animals in Belgium, for 1876. What enhances the value of the case is, that it was under observation for four years.

At the fair of Tirlemont, in February, 1873, Mathieu bought a cross-bred English horse, eight years old, which appeared to be sound. Next day he was astonished to find it presenting all the symptoms of Ophthalmia, affecting the left eye. The eyelids were closed, there was abundant lachrymation, conjunctival redness, slight contraction of the pupil, flow of a limpid serosity from the nostril, and an absence of evident alteration in the other parts of the eye. In the course of six or seven hours these symptoms disappeared, but reappeared on the following days. Towards the end of March the attacks gradually diminished in frequency and intensity, and ceased altogether at the end of April. Sometimes one eye, sometimes the other, was affected, but rarely were both eyes simultaneously involved.

Next year, during one of the first days in February, the horse, after active exercise for some hours, commenced to shake his head, as if to get rid of some foreign body lodged in one of his ears, which were thrown back as if the animal were angry. After fifteen days to three weeks, symptoms of Ophthalmia—of the same character as in the previous year—were added to these manifestations.

The attacks were at first so infrequent as seven or eight days, but the interval gradually diminished until towards the end of February, when at last they became quotidian. Travelling fast against a cold and damp wind increased the intensity of the attacks, which continued as in 1873, and terminated at the same epoch.

In 1875 the malady appeared in the same way and with the same characters, and disappeared at the usual period. In 1876 it was the same, except that the attacks were more severe, and in addition to the symptoms already described, there were others, which Mathieu thought due to a Dental Neuralgia.

In the prehension of oats the horse drew back suddenly, as if some foreign body in them had pricked him ; and mastication was performed slowly and with difficulty. The prehension of soft or pulpy food was accomplished with much less difficulty. These symptoms only continued for four or five days, and during this period Mathieu carefully sought for painful points about the face, but without finding any.

THE WAR IN ZULULAND.

THE campaign in Zululand, which is now drawing to a close, if it is not already ended, has not been without interest to veterinary surgeons, particularly those in the army. In many respects this part of South Africa was a *terra incognita*, and nearly everything relating to it had to be discovered as the war progressed. This was a serious disadvantage to the Army Veterinary Department, which found itself in presence of unusual difficulties beyond those experienced in ordinary warfare. Not only this, but the very long sea voyage to Natal, and the large number of horses embarked from this country, as well as mules from America, necessitated an amount of prevision and care which is not usually required. We have already referred to the success which attended the transportation of these animals, and we have only now to add that the last ship which left England carrying a large number of remounts only lost one horse in transit.

Notwithstanding the effects of sudden change of climate, absence of shelter, insufficient, bad, and often unaccustomed food, severe toil and hardship, the presence of that as yet mysterious malady—Horse-sickness, strange and sometimes poisonous pasturage, bad water, parasites, as well as the casualties incidental to irregular warfare in a savage country, the losses have been remarkably few. Of 1,581 horses landed at Durban, up to June 23 only 77 had died and been destroyed, and 57 remained on the sick report. Of the deaths, 21 were due to Horse-sickness, 1 to snake bite, and 9 to poisoning by what is called "tulip-grass." We shall refer to the latter in our next number, as we have received a description of the symptoms induced by the plant, as well as a specimen of the plant itself. It may suffice here to note that it does not belong to the grasses nor yet to the tulip family, but is a cormaceous plant, with a leaf like the snow-drop. Other deaths were due to chest affections (16), derangement of the digestive organs (10), Farcy (1), rupture, paralysis, abscess, Laminitis, debility, etc.

The mortality among the draught oxen has been very great ; on the Lower Tugela as many as 12 were dying every day, the cause being insufficient supply of grass and general unhealthiness of the coast, together with foul camping-ground around Forts Pearson, Tenedos and Chelmsford.

"Lung-sickness" (Contagious Pleuro-pneumonia) must also be credited with some share of the mortality, and it is apparent that the herds of the Zulus themselves are not free from the scourge.

Veterinary surgeons Morgan and Killick were suffering from Fever at Fort Chelmsford.

CONCRETIONS IN BURSAUTTI ULCERS.

A SHORT time ago our colleague, Mr. Meyrick, of the Royal Artillery, sent us some small, hard, reddish pieces of matter which he had removed from Bursautti sores, and which the natives designated "kunkur." His description of them appears in the Journal for November last. Dr. Thin, to whom we handed the specimens for microscopical examination, could make but little of them. When a portion was examined in water, it appeared to be quite amorphous ; with acetic acid it looked somewhat like a hardened cell-conglomeration, but the appearances were not sufficiently marked to justify a statement. The masses may be, and probably are, concretions of pus and epidermic cells formed by heat and dryness. No parasites or organisms of any kind could be detected.

TREATMENT OF ANTHRAX WITH CARBOLIC ACID.

SOME time ago we suggested the desirability of testing the therapeutical action of carbolic acid in the very fatal anthracic disease known in India as "Loodianah Fever." The principal veterinary surgeon at Simla, Mr. F. F. Collins, reports to us that of eighteen cases of the disease occurring at Barrackpore, eleven have been cured by administering half-drachm doses every four hours, with aromatic spirits of ammonia in the intervals. This success is very gratifying, and in urgent cases it might be greater if larger or more frequently repeated doses were given.

THE COLLINS' PRIZE ESSAYS.

IT is announced that the award of the two prizes of two hundred and one hundred rupees, offered by Mr. F. F. Collins, Principal Veterinary Surgeon, India, for the best essays on the Stable Management of Horses in India, has been made. Mr. Poyser, F.R.C.V.S., "The Carabineers," being the winner of the first, and Mr. Queripel, Royal Artillery, obtaining the second prize. The judges were Major-General Sir Frederick Fitzwygram, Bart., F.R.C.V.S., Inspector-General of Cavalry, Mr. J. Collins, F.R.C.V.S., Principal Veterinary Surgeon, and Mr. G. Fleming, F.R.C.V.S., 2nd Life Guards, who were much gratified with the merits of the essays. We have much pleasure in publishing the first portion of Mr. Poyser's essay in the present number of the Journal, the remaining portions appearing in due course, and we would commend their careful perusal to the younger members of the Army Veterinary Department more particularly, as well as to all who are interested in the welfare of our great Indian empire.

HORSE-POX.

THE subject of Equine Variola must always be of interest to the enlightened veterinary pathologist, from the circumstance that when transmitted to the bovine species it produces Vaccinia, and this again, when conveyed to mankind by inoculation, confers protection against Small-pox. It possesses additional interest for English pathologists, from the fact that it was first described by Dr. Loy, of Pickering, in 1802, and though no mention is made of it in our professional literature, except in "Veterinary Sanitary Science and Police" (Vol. ii. p. 73), yet the disease is sometimes prevalent in this country, and has been carefully studied by veterinarians and others at various times on the Continent.

Quite recently an epizoöty of the disease occurred in France, and three medical men, MM. Pingaud, Viseux, and Thomas, availed themselves of the opportunity to make some experiments. Pingaud selected a four-year-old horse which had previously been quite healthy, but which at the time he began his experiments had a very well marked discrete eruption of vesicles covered by crusts in the neighbourhood of the shoulder, as well as others inside the cheeks and upper lip. These latter were not crusted, but had a white or pearly hue. The fluid in these was carefully collected, and seven young soldiers who had not been vaccinated were inoculated with it. After an interval of six days, six of these men had small pustules with inflamed base on the point of inoculation. From four of these cases lymph was obtained sufficient to inoculate sixty-four soldiers, eight of whom had not been vaccinated. The result of this further experiment was the development of forty characteristic pustules, being sixty-four per cent. of successful inoculations, which were unattended with any serious accidents, a very few only having furunculous appearances. Calves were also successfully inoculated with the Horse-pox virus, and from them secondary inoculations were made on people; but the activity of the virus appeared to have become diminished in passing through the calves, for, strange to say, the proportion of the successful vaccinations was forty-eight per cent.

During former experiments carried on at the Alfort Veterinary School, some accidents of a more or less serious character occurred. But Pingaud is of opinion that they were owing to the way in which the inoculation was made. He avoided mishaps by using only the fluid in the pearl-like pustules on the mucous membrane of the mouth, which he found to be quite innocuous, being satisfied that the blood, saliva, and crusts are septic. In proof of this all his cases ran a simple course; whereas a man who had inoculated himself with fluid from a cutaneous pustule suffered from Lymphatitis.

Proceedings of Veterinary Medical Societies, etc.

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

AT a meeting of the Scottish section of the Court of Examiners, held in Edinburgh, on July 14th, the following students passed their Second Examination:—

Edinburgh New Veterinary College.

Mr. William Summers.
„ John Aitken.
„ William Edward Livock.
Mr. John Fisher Thompson.
„ James Joseph Mullally.
„ John Edwards.

Edinburgh Veterinary College.

Mr. John Teggart. Mr. Robert Levie.
Mr. Johnson Gibbins.

Messrs. William Edward Livock, John Fisher Thompson, John Teggart, Robert Levie, and Johnson Gibbins passed with great credit.

At the meetings held in Edinburgh and Glasgow, on July 15th, 16th, 17th, 18th, and 19th, the following students passed their First Examination :—

Edinburgh Veterinary College.

Mr. John Roberts.
" William Cassells.
" Richard William Burke.
" Thomas Gilchrist.
" William Fairbairn.
" John Alexander Thompson.
" John Beattie.
" John Bull.
" William Henry Jones.
Mr. John Joseph Doyle.
" Robert William Powell.
" John Robert Beech.
" James Gibson.
" Patrick Dundon.
" Thomas Wright.
" William Watt Dollar.
" William James Powell.
" James Fitzgerald.

Edinburgh New Veterinary College.

Mr. William Woods.
" Henry Cooper.
" Thomas Green.
" Isaiah Leather.
" John Jones.
Mr. William Graham.
" James Bell.
" John Francis Healy.
" Frederick Eugene Rice.
" Joseph McCauley.
Mr. John Metcalfe.

Glasgow Veterinary College.

Mr. William Davies Hunter.
" Alexander Macadam.
" James Somerville Bond.
" John Blackley.
" Richard Ebbitt.
" Henry Rogers.
" Benjamin Headley.
" Alexander Crichton.
" James Fleming Alston.
" Robert Roberts.
" James Arthur Gosling.
Mr. T. Montgomery McCauley.
" Andrew Carnduff.
" Michael Yeats Lees.
" John Taylor.
" Archibald McNicol.
" Robert Black.
" Thomas McLay.
" John Freeman.
" James Marsh Robinson.
" William Watt.
" Frederick Foster.
Mr. Gavin Alston Herron.

Mr. William Watt Dollar passed with very great credit; and Messrs. John Roberts, Richard William Burke, John Alexander Thompson, John Joseph Doyle, John Robert Beech, William James Powell, William Woods, Thomas Green, William Davies Hunter, Richard Ebbitt, Henry Rogers, Robert Roberts, James Arthur Gosling, John Taylor, John Freeman, James Marsh Robinson, and William Watt, with great credit.

ROYAL (DICK'S) VETERINARY COLLEGE, EDINBURGH.

PRIZE AND HONOURS LIST—SUMMER SESSION, 1879.

Chemistry—Gold Medal, William Watt Dollar; Silver Medal, John J. Doyle; Third, R. W. Burke; Honours Certificates, John Robert Beech, Clement Burston, Patrick Dundon, John A. Thompson, William J. Powell, Thomas Wright, William Fairbairn.

Materia Medica and Toxicology—Silver Medal, R. W. Burke; Second, W. W. Dollar; Honours Certificates, J. J. Doyle, William H. Jones, T.

Wright, J. R. Beech, P. Dundon, J. A. Thompson, John Roberts, W. J. Powell.

Botany—Silver Medal, W. W. Dollar; Second, J. R. Beech; Honours Certificates, R. W. Burke, W. J. Powell.

Junior Anatomy—Silver Medal, W. W. Dollar; Second, R. W. Burke; Honours Certificate, J. J. Doyle.

Practical Histology—Honours Certificates, W. W. Dollar, J. Roberts, R. W. Burke, James George O'Donel.

Best Essay on the Entozoa of Domestic Animals—Silver Medal, R. W. Burke; Second, Robert Levie.

GLASGOW VETERINARY COLLEGE.

THE summer session of this institution terminated on June 17th, and on the 20th and 21st the examinations for the diploma of the Royal College of Veterinary Surgeons were conducted within the museum of the college.

The Board of Examiners included the following gentlemen:—Professor Alexander Crum Brown; Dr. Andrew Wilson, University, Edinburgh; Dr. Dunsmure, Edinburgh. The following gentlemen were also present as *ex-officio* members, viz:—Principal M'Call, F.R.C.V.S.; Professor Knox, M.A., M.B.; Stephen Cooke, F.C.S.; and James Macqueen, M.R.C.V.S., Glasgow Veterinary College.

Twenty-six students presented themselves for the first professional examination, and of this number, twenty-three were successful in passing a highly creditable examination; Messrs. Roberts, Gosling, Rogers, Ebbitt, Hunter, Freeman, Taylor, Robinson, and Watt, passing with great credit.

Medals granted by the Highland and Agricultural Society of Scotland, Principal M'Call, and certificates of merit granted by the college, were awarded in the different branches of study as follows:—

Botany—Gold Medal, Mr. Henry Rogers, Bombay, India; Silver Medal, Mr. John Taylor, Cathkin. First class certificates—Mr. John Freeman, Dublin; Mr. Richard Ebbitt, Dunleer, Ireland. Second class certificates, Mr. J. Gosling, London; Mr. M'Lean, Glasgow; Mr. R. Roberts, Colwyn, Wales.

Chemistry—Gold Medal, Mr. James Gosling; Silver Medal, Mr. Henry Rogers. First class certificates, Mr. Richard Ebbitt, Mr. John Freeman, Mr. A. Crichton.

Materia Medica—Gold Medal, Mr. John Freeman; Silver Medal, Mr. Robert Roberts. First class certificates, Mr, James Gosling, Mr. Henry Rogers, Mr. James Robinson, Bamford. Second class certificates, Mr. John Taylor, Mr. Benjamin Headley, Carlisle; Mr. Thomas McLay, Glasgow.

At the close of the lectures, on Tuesday, the students assembled in the lecture-room, under the presidency of Principal M'Call, when Mr. Campbell, on behalf of his fellow-students, in a graceful speech, presented Professor Cooke with a handsome silver jug as a mark of their appreciation of his ability and merit as lecturer on chemistry and botany.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Society was held at the Blackfriars Hotel, Manchester, on June 25th. W. Dacre, Esq., President, in the chair. There were present:—Messrs. P. Taylor, T. Taylor, W. A. Taylor, T. Hopkin, E. Faulkner, J. B. Wolstenholme, J. O. Martin, J. Lawson, A. Lawson, of Manchester; W. Pallin, Esq., 20th Hussars, S. Wilson, Esq., 12th Lancers, Messrs. Hutcheon and Leather, of Liverpool; A. Darwell, Knutsford; A. Robinson, of Greenock; J. Hart, Oldham; H. Beard, Macclesfield; H.

Longman, Warrington ; W. Woods, Wigan ; W. Whittle, Worsley ; T. Briggs, Bury ; Dr. Renshaw, Altrincham, and the Secretary.

Letters of excuse were read from Professors Pritchard, McCall, Williams, and Messrs. T. S. Faulkner, C. Challinor, C. W. Elam, W. Thompson, M. E. Naylor, E. Sudren, T. A. Dollar, J. Welsby, and M. J. Roberts.

The SECRETARY also read a letter from Mrs. A. Challinor, thanking the members for their kind address of condolence and sympathy on the death of her husband.

Before commencing business, the President referred to another loss the Society had sustained by the death of one of its earliest members, and he hoped before the close of the meeting some member would propose that a letter of condolence be offered by the Society in the shape of a memorial address.

The SECRETARY nominated for membership, Messrs. G. Humphries, and W. Holland, Manchester ; Mr. J. Leather, sen., Liverpool ; and Mr. H. T. Hodgkinson, Rochdale.

Mr. W. A. TAYLOR then read report of Election Committee :—"The duty I have to perform is short, but in one respect, I am pleased to say, is sweet. Your committee, which was appointed at the last meeting, met on one occasion only ; at that meeting they decided the course they should pursue with reference to bringing about the election of the gentleman nominated by the Society as a member of Council of the Royal College of Veterinary Surgeons. That gentleman is Mr. Whittle, and I am pleased to say the result is that he has been elected a member of that board."

Mr. W. WHITTLE, in response, said that he thanked the members and those who had accorded him their vote for the honour they had conferred upon him.

Mr. PALLIN, 20th Hussars, then brought before the meeting several interesting cases, also showing specimens of same, including a case of Rheumatic Arthritis in a horse, disease of the vertebra, disease of the spleen, Lymphadenoma, and dislocation of the atlas and dentata, all of which were carefully examined, and a long discussion ensued, in which nearly all members took part. At the close of the meeting, a cordial vote of thanks was accorded Mr. Pallin for his kindness in bringing the above before the members.

Mr. W. DACRE also placed upon the table a morbid specimen of "Diaphragmatic Hernia" of long standing, also rupture of the flexor tendon, with the history of both cases ; these were fully discussed, and the thanks of the meeting were accorded Mr. Dacre.

In the absence of Mr. Sudren, the SECRETARY exhibited a peculiar specimen sent by him, supposed to be an ossified brain of the horse, weighing 4¼lbs., and resembling that organ in formation. The history of the case is as follows : On March 2nd a brown gelding, 16-2 in height, was brought to the horse-slaughterers to be slaughtered, he suffering from Elephantiasis and Stringhalt ; he was struck in the ordinary way, with a pole-axe, without any effect for about a dozen times, when the owner (who was present) said they had better "stick it," and that it was always a stupid animal, and did not care for any amount of punishment inflicted by the whip. This fact led to the discovery of the morbid condition, for on looking into the skull the tumour was found surrounded by a limpid fluid. Mr. Sudren did not see the head, so cannot say what amount of brain-substance was left, or the exact position of the bony tumour. After an animated discussion, the members were of opinion that it was not ossification of the brain, but an osseous tumour, which had gradually formed in the cranial cavity.

Mr. W. A. TAYLOR then moved that a letter of condolence be forwarded to Mrs. W. J. Challinor, sympathising with her in the great loss she has sustained by the death of her husband. By his death a gap was created in the ranks of the Society, he being one of the original members. At the commencement of the Society he gave it perhaps more attention than he had

done recently. However, he was a good man, and one who supported our cause on every occasion when he had an opportunity. Mr. JOHN LAWSON very cordially seconded the motion. Mr. W. WHITTLE said he had known Mr. Challinor for the last thirty years, and no one could regret his death more than he did, or sympathise more truly with his widow; he begged to support the motion, which was carried unanimously.

Mr. W. A. Taylor, the President and Secretary, were proposed to draw up the letter. A vote of thanks to the chairman closed the meeting.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting was held at the Queen's Hotel, Leeds, on the 23rd of July, the President, Mr. Peter Walker, in the chair. The following members were also present, viz., Messrs. James Freeman, Naylor, Greaves, J. S. Carter, Cuthbert, Bale, Murdock, Parlane Walker, Lodge, Beeson, Deighton, and the Secretary. Mr. Greenhalgh, student, was present as a visitor. Apologies for non-attendance were received from Messrs. Dray, Danby, Joseph and John Freeman, and Ferguson.

The minutes of the previous meeting were read and confirmed. Mr. John Nettleton, M.R.C.V.S., Northallerton, was nominated for membership.

Mr. GREAVES introduced the subject of a very unfortunate matter now in process of legal dispute. A member of the profession, a very respectable and highly practical man, was being sued for a very large sum of money, nearly £200, for having, as it is alleged, passed a valuable hunter as *sound* in his respiration; whereas, within twelve days afterwards, two veterinary surgeons of eminence had certified the said horse to be *unsound* in his respiration. The affection of the respiratory organs in question he understood to be "Roaring," and he was desirous to know the opinions of the members present as to the causes of "Roaring," and whether this affection could be produced in less than fourteen days without any preliminary symptoms, such as cough, sore throat, or febrile symptoms, etc., etc. He understood that the seller of the horse in question—an officer of the Guards—was not aware that any impediment to respiration was in existence.

Mr. CUTHBERT made a few preliminary observations upon the subject, and then related a case of "Roaring" coming on within fourteen days without any premonitory symptoms.

Mr. PARLANE WALKER said that it occasionally happened that a horse became a "roarer" after a lengthy and severe gallop.

Mr. NAYLOR had known instances of horses becoming suddenly affected with "Roaring" in consequence of some violent collision producing partial paralysis of the recurrent nerve.

Messrs. FREEMAN, CARTER, and the SECRETARY also expressed their opinions that "Roaring" may be produced in a horse in a few days, without any visible premonitory symptoms.

A unanimous expression of opinion was given that the action against the veterinary surgeon in question ought to be defended.

The PRESIDENT gave the history of a diseased ovary in a cow.

Mr. FREEMAN described a case of diseased frontal sinuses in a horse.

Mr. PARLANE WALKER gave the history of some rather obscure symptoms attacking dogs, which he attributed to the affection known as "Dumb-madness."

Mr. NAYLOR was of opinion that the dogs referred to by Mr. Walker were affected with Dumb-madness, and gave the history of some similiar cases, etc., etc. He remembered a mad dog once travelling from seventy to eighty miles away from his own home within twelve hours.

Mr. J. H. FERGUSON, of Leeds, has kindly volunteered to read a paper, "Upon the Present Epidemic of Pig Typhoid in Leeds," at the next meeting.

WM. BROUGHTON, *Hon. Sec.*

Jurisprudence.

SCABIES IN SHEEP.

A QUESTION of great interest, not merely on account of the rank of the person concerned, came on, Monday, June 2nd, before the bench of county magistrates which sits at Walsingham, in Norfolk. The Earl of Leicester, the lord-lieutenant of the county, was summoned by the veterinary inspector of the local authority for the district—first, for causing a sheep affected with Scab to be driven along the highway; secondly, for causing certain "suspected" sheep to be driven along the highway. The defendant pleaded "not guilty," and the case was gone into at great length. The facts appear to be as follows:—It is not questioned but that, in the autumn of last year, Sheep Scab *did* exist on the Earl of Leicester's farm at Holkham. It was duly reported to the local inspector, and a professor (Professor Axe) specially summoned from London confirmed the local authority. On December 24th the flock was again examined, and the London professor this time shook his head, and said, "If Scab at all, it was a very mild form;" whilst Mr. H. Woods, the experienced manager of the Merton flock (Lord Walsingham's), who had been invited to attend, spoke with equal hesitation. On January 28th the local inspector visited again, and said (and this statement again was not challenged) that he found one case of Scab. The shepherd himself a day or so after found two more infected animals; and the whole three were at once slaughtered by the Holkham manager. In the course of the month of February the agent for Lord Leicester (assuming that no Scab existed at Holkham) sold a part of the sheep (the turnips being finished) to a dealer, "to be delivered at the fold." On February 27th the Holkham manager applied to the local inspector for an order of removal for the sheep. He refused, and said that, in the manager's absence on the 25th, he had visited the flock, and found *one* slight case of Scab. The services of a veterinary (himself the local inspector for another district) were called in on March 1st, and he reported (after examining the whole flock) that the sheep were quite free from Scab. He gave the Holkham manager a certificate to this effect; and on March 3rd the dealer's man came to the fold and took away part of the sheep, and the remainder on the 5th. This removal constituted the alleged offence. For Lord Leicester it was contended—First, that the sheep on March 3rd were the property of the dealer, and were moved by him at his own risk; secondly, that after the assurance of the competent authorities consulted in December, and that of the neighbouring veterinary on March 1st, the sheep moved could not properly be described as "suspected" by his lordship or his agents. Indeed, the second charge turned on this—*i.e.*, whether it was necessary to prove that the owner had reason to suspect the presence of disease? or whether the suspicion of the local authority's officer rendered movement illegal? The bench, leaving each party to bear its own costs, dismissed the case. It should also be added that the sheep moved March 3rd and 5th did not, when they reached their new owners, show any sign of Scab, nor have they since shown any.

MALPRAXIS IN CASTRATION.

Aberdeen Sheriff's Court, May 25th.

IN this action, which was at the instance of A. Leslie, of Old Deer, against A. Smith, blacksmith, Hatton, Cruden, and T. Smith, Brunthill, Cruden, Sheriff Smith pronounced an interlocutor, recalling that of Sheriff Thomson. The pursuer sued for £30 as damages in consequence of the defenders

having castrated a colt in such a reckless and careless manner that it died some time after the operation. The defence was a denial of the pursuer's averments. Sheriff Thomson assoilized the defenders with expenses. Sheriff Smith now recalled that interlocutor, and found that the castration was performed with such carelessness that, after much suffering, the colt had to be shot. The Sheriff, therefore, found the defenders liable in damages, and assessed these at £21, for which he discerned with expenses. The following is the note to his lordship's interlocutor:—The defendant, A. Smith, is a blacksmith, forty-six years of age. He served an apprenticeship with his father, who has castrated for sixty years, and for ten years he has been accustomed to perform the operation himself. It is not said to be a difficult operation when reasonable care is taken, and there is no reason to suppose that he does not possess the requisite skill and knowledge of the business for which he held himself out as sufficiently qualified. But on the evidence it is, in the opinion of the Sheriff, impossible to acquit himself of carelessness on the occasion in question. His mistake lay in the manner of adjusting the clams. Professional manuals on the subject point out the importance of taking care that the part to be incised is external to the clams; but through the neglect of this caution, the penis was cut more than half through. The thing speaks for itself. No instance can be given of such a thing having happened before. Mr. Fowlie never heard of it. Mr. Simpson can see no excuse for it; and although the defender says it was an accident, he gives no satisfactory explanation why it should be so regarded. It is argued that the pursuer, by employing his own veterinary surgeon, treating the animal for three weeks according to his directions, and shooting it with his own hand without communicating with the defenders, lost any claim he had against them. But it is evident that the serious nature of the injury was not at first suspected, nor a fatal result apprehended; and if no formal intimation was made to them, they were kept duly informed of the condition of the colt from time to time. The pursuer acted with perfect propriety in calling in the veterinary surgeon of experience the day after the operation. It is abundantly proved that his instructions were carefully carried out, and at the last it surely did not require a sheriff's warrant to end the poor beast's agonies. It may be questioned whether it was lock-jaw or something else which finally set in; but the evidence sufficiently proves that the loss of this colt was due to the fault or carelessness of the defenders. They are therefore liable in damages, but they have been assessed at a very moderate sum.

Army Veterinary Department.

Gazette, July 22nd.

VETERINARY DEPARTMENT.—Veterinary surgeon Charles Edward Smith resigns his commission: dated July 23rd, 1879.

Gazette, August 14th.

VETERINARY DEPARTMENT.—Inspecting veterinary surgeon B. Channing Rouse Gardiner is placed on retired pay.

We have much pleasure in learning that the Indian Government has sanctioned the sum of 150 rupees per month to veterinary surgeons Poyser and Queripel, as a deputation allowance, and eight annas a mile when travelling by road, three by rail, with five rupees *per diem* when halted, in addition to their ordinary pay and allowances, during the time they are employed under

civil administration and in connection with veterinary sanitary science in the Punjab, especially with reference to the two great roads leading into Afghanistan *via* Jumrood and Thull. In performing their special duties, Poyser and Queripel have materially aided in suppressing Cattle Plague and Foot-and-Mouth Disease among the transport cattle, and so did good service in bringing the campaign in that region to a successful conclusion.

There are rumours of contemplated important modifications and improvements in the Indian Veterinary Department, necessitated by the state of affairs to which we have so frequently called attention.

Parliamentary Intelligence.

House of Commons.—August 7th.

ARMY VETERINARY SURGEONS.

COLONEL ARBUTHNOT asked the Secretary of State for War if he would state the number of veterinary surgeons disqualified as regarded eligibility for promotion to the first-class grade by the operation of the Veterinary Warrant of 1878, and the reason why those veterinary surgeons who had completed the twelve years' qualifying service still remained unpromoted; and whether certain letters and documents complaining of and urging a reconsideration of the warrant, which were received at the War Office prior to the commencement of the present session, had yet been referred to him, and if so, whether he had arrived at any decision on the subject.

Colonel Stanley said he was not at present prepared to give the numbers referred to in the first part of the question, but if the hon. and gallant gentleman would repeat that part of the question at a future date he would endeavour to supply them. With regard to the reconsideration of the warrant, there were certain calculations which would have to be made before he could give a decision on the matter, and, owing to pressure of business, the actuary had not been able to furnish him with the results of those calculations up to the present time.

House of Commons.— August 14th.

LOSS OF CAMELS IN THE AFGHAN WAR.

IN reply to Sir A. Hayter, Mr. E. Stanhope said no telegram containing detailed information respecting the loss of camels during the campaign in Afghanistan had yet reached the India Office, but he was afraid there was no doubt that the loss of camels was heavy.* Nothing in the correspondence from India led to the idea that, "owing to the want of transport, the Kyber force could not have advanced to Cabul if Yakoob Khan had defied us." It was understood that the terms offered to camel owners would cover all risk.

* We have reason to believe that the loss in camels, instead of being 40,000, as we have already mentioned, is likely to be 61,000, an appalling destruction for which there does not appear to be any adequate reason.

Notes and News.

TRICHINOSIS IN AMERICA.—The following extract from the *Rochester Democrat* of May last, will serve as additional evidence to prove that Trichinosis prevails in the United States, and that its existence "has not yet to be determined." "Our readers will be shocked to learn that another clearly identified case of *Trichiniasis* has appeared in the vicinity of Rochester, death resulting from the disease. The circumstances as reported are as follows:—Yesterday morning Dr. J. D. Dunning, of West Webster, came to this city and showed Dr. Porter Farley a portion of muscle taken from the forearm of a lady named Mrs. Hames, who died in that village on Saturday evening last. The lady, the daughter of Mr. Giddings, the well-known constable of Webster, was taken ill at the house of Squire Bancroft in that village. After the first attack she went to the house of her father, where she was attended by Dr. Dunning. The disease appeared mysterious and baffled all remedies administered. A sister of the woman, Mrs. Hetzler, was also taken sick with symptoms somewhat similar in nature. Dr. Dunning did all that he could, but on Saturday Mrs. Hames died. The physician, though unused to the disease, made up his mind that the patient was suffering from *Trichiniasis*, and made his diagnosis accordingly. After death he removed a small portion of the muscles of the forearm, and, as above stated, brought it to Dr. Farley for examination. The investigation proved beyond the shadow of doubt that *trichinæ* existed in countless numbers in the muscles of the deceased. Dr. Dunning is entitled to great credit for his judgment and skill. It is said that a family named Langdon, consisting of Mrs. Langdon, a daughter and two sons, besides Mrs. Hetzler, the lady above mentioned, are now sick with symptoms similar to those of Mrs. Hames.

HIPPOPHAGY IN GERMANY.—In Berlin, as in Paris, hippophagy appears to be on the increase. At the present time as many as twenty horses a day are cut up for food at the Central Horse-Slaughterhouse of the former capital, representing a weight of at least five tons of flesh. Much of this is doubtless consumed as beefsteaks and beef sausages by unsuspecting customers at cook-shops and eating-houses. In every instance, however, it may be relied upon with confidence that this meat, although certainly horseflesh, is perfectly sound and good. No horse may be slaughtered anywhere in Berlin or the neighbourhood except at the central institution named, and any butcher dealing in horseflesh obtained from other sources is liable to such heavy punishment that infringements of the law in this respect are altogether unknown. The work at this central depôt is conducted with every possible care. An inspector and a representative of the police reside upon the premises, and every animal is slaughtered and dressed under the immediate supervision of two veterinary surgeons attached to the establishment. While awaiting its doom each horse is housed and tended with scrupulous care, and when the fatal day arrives no suspicion of "cruelty to animals" attends the accomplishment of its death. The victim is led blindfold into an open space, and killed instantaneously by a skilful blow on the skull from a narrow, sharp-pointed hammer. All the internal organs are then carefully examined by both resident surgeons, and if the slightest trace of disease be detected the carcass is condemned as food. The meat is mostly consumed by the poorer classes of the community, who are thankful to get the sound flesh of a clean-feeding horse at prices within their reach.

SNAKE POISON.—Some interesting observations have recently been made on the poison of serpents by M. Lacerda, in the physiological laboratory of the National Museum at Rio Janiero, which have led him to the conclusion that, in some cases at least, the venom contains an organised ferment pre-

senting some analogies to bacteria. M. Lacerda states that a drop of venom removed from a rattlesnake under the influence of chloroform and examined with the aid of a microscope appears as a "species of filamentous protoplasmic matter, consisting of a cellular aggregation disposed in arborescent form resembling certain lycopods." The development and reproduction of these cells is described in a paper read before the French Academy of Sciences (*Comptes Rendus*, lxxxvii. 1094). Similar phenomena were observed in the blood of animals that had been bitten by the rattlesnake, and it was found that such blood was capable of setting up the change in the blood of other animals when injected hypodermically, and that this change was always followed by the death of the animal.

A HOSPITAL FOR AGED ANIMALS.—An asylum for aged domesticated animals has just been opened by an inhabitant of Gonesse. There are already a cow 36 years of age, a pig aged 25, and an 18-year-old goat. The senior member of this happy family is, however, a mule. He is 40 years of age. Next comes a sparrow, whose summers number 31. Twenty-eight years of life have been granted to a goldfinch; whilst a guinea-fowl and a goose have respectively reached the age of 12 and 37 years.

THE VALUE OF INOCULATION FOR CONTAGIOUS PLEURO-PNEUMONIA.—In Baarderadeel, in the province of Friesland, three cattle insurance companies were established. The first insisted on the inoculation of all cattle assured in its office, the second required only cattle under three years old to be so treated, and the third rejected inoculation altogether. In the result, the first company had to pay 1.65 per cent. of the sums assured, the second 3.85 per cent., and the third 9.10 per cent., in payment of claims on diseased stock. In those districts of Holland where Pleuro-pneumonia has become more or less enzoötic the calves are inoculated in autumn as a matter of course, and the operation is repeated later in the full-grown stock. In other districts inoculation is only practised when the disease appears in the herd, or is close at hand. The view is generally entertained that inoculation loses its protective power after three or four years.

RABIES CANINA IN AFGHANISTAN.—A correspondent of the *Army and Navy Gazette*, writing from Kandahar, whither he had accompanied the Afghan expedition, states: "We have had a good deal of Hydrophobia lately, as pariah dogs may be counted by hundreds on the skirts of the camp, and the sudden arrival of summer affected their sanity. Had they kept their 'Rabies' to their own kind it would have been bad enough, but they proceeded to communicate the same to several horses. Col. Hill, Major Chapman, and Captain Gaselee, all lost horses in consequence, also Captain Rogers; while polo ponies to the number of some dozen were bitten."

THE TSETSE-FLY OF AFRICA.—It has been asserted by many writers that the tsetse-fly is not fatal to donkeys and mules. I know the contrary to be the fact. The fly-country may be penetrated with comparative safety, and trekked across during long and cold winter nights with animals of any kind; but those that get stung invariably die when next they are exposed to a rainy season. Oxen drop off almost immediately after the first rains, as do horses. Mules and donkeys, on the contrary, wither away slowly, their muscles drying up through the effects of the poison until they become mere skeletons, when they fail from exhaustion.—*The Transvaal of To-day.*

A VERY OLD HORSE.—In "Notes and News" for last August, we alluded to an American horse thirty-five years of age, and which was then alive. The *Galloway Gazette* for November 10th, 1877, records the death of a mare at an extraordinary age, which is chronicled in the following terms: "Last week we recorded the death of a centenarian, and though we have not such an

extraordinary event to chronicle this week, yet we have to record the demise of certainly the oldest of her tribe in the country. It is no other than the death of 'Irish Molly,' a mare, as her name implies, of Irish extraction, who for the last forty-four years has been in the possession of Messrs. M'Lurg, of Newton-Stewart. This wonderful Bucephalus was imported in the year 1833, and she speedily devoted herself steadily to agricultural work, to the interest and satisfaction of her employers, who were highly pleased with their bargain. For speed and endurance this valuable Irish relic had few equals, and she continued at her post until a year or two ago, when her fidelity was rewarded by a Paradise of ease being provided for her in the Newton-Stewart Market Field. Although of Irish birth she may be considered a naturalized Scottish subject, inasmuch as she has resided here for four-and-forty years. We can also say without exaggeration that she had a large circle of admirers in the agricultural community of the district, and they will be interested to know that this week, 'old and greyheaded,' she has died in her forty-fourth year."

PREVENTION OF CONTAGIOUS PLEURO-PNEUMONIA IN HOLLAND.—One favourite system of guarding against the invasion of the disease is to give each animal, according to weight and age, from 1 lb. to 2 lbs. of Swedish tar, mixed with a handful of salt, at the end of October. The nostrils are also rubbed with the same preparation. If the disease be prevalent in the immediate neighbourhood, half such a dose is given every week; if the district be free from it, then only once a month. Freshly-bought stock always have a dose immediately on their arrival. Those who have adopted this plan are said to have preserved the health of their cattle, while the herds of neighbours who neglected it were decimated.

THE SIBERIAN ANIMAL PLAGUE.—The Siberian Plague (the *Yaswa*, or "Boil Plague"—in reality Anthrax) has appeared amongst animals in the district of Nova-Ladoga, in the government of St. Petersburg, and the prefect of the capital has issued instructions to the house-watchmen to notify all cases of doubtful illness amongst domestic animals; and has, at the same time, ordered increased police and veterinary supervision. The official report respecting the Plague in Russia during 1877 gives an idea of the extent of epizoötic disease in that year. The statistics show that 212,768 head of cattle and 23,630 horses died of Siberian Plague in the forty governments of Russia during the twelve months.

EVERGREENS AND FARM STOCK.—A good deal has been said on the poisonous nature of yew tree clippings, and every now and again we hear of cows or horses being poisoned by munching the branches that have been carelessly thrown in their way. The *Journal of Forestry* points out that the danger is not confined to the yew tree, but that many other evergreens possess the same deadly capability when in a half-withered state. Horses, and even pigs, have been destroyed by eating the clippings of laurel and box trees. Ivy prunings have proved as fatal to sheep, and it is said that fallow deer have occasionally been killed by being permitted to browse on the same plant, which, though apparently wholesome enough when in a fresh growing condition, appears to acquire a deleterious character when it has ceased to grow and becomes shrivelled and dry. Our contemporary has noted fourteen cases that have occurred this spring, and seems inclined to attribute the acquisition of a poisonous character to incipient fermentation. There may be something in this, perhaps, but it seems just possible that the noxious principle is contained in the juices of the living plant, and merely becomes concentrated by the drying of the branches clipped off. It seems certain that animals may eat with apparent impunity not only box and laurel, but the yew tree also when in a growing state, but it may reasonably be doubted whether they do not receive more or less injury from them, and, until the

matter has received a little more attention than it has done, owners of farm stock would do well to look to the fences of their shrubberies and ivy growths. The question is raised as to whether clippings are as deadly at other seasons of the year as they are in spring. This is considered to be doubtful, but it is a fact that animals have been killed by prunings of the kind referred to at all seasons, and care should be taken at all times therefore, although it may be a fact that the poison may be more virulent at one time than another.

DIPHTHERIA TRANSMISSION.—M. Trasbot, of the Alfort Veterinary School, has of late made several experiments for the purpose of testing M. Nicati's supposition that the Diphtheria of fowls could be transmitted to human beings. According to the results of these experiments, which he communicated to the Société de Biologie, false membranes, blood, and mucus, which were taken from diphtheritic cocks and hens and applied to the mucous membranes, or introduced into the cellular tissue of several animals, have only given negative results. These experiments are of but little value in the dog, as he is not subject to Diphtheritis, and possesses a remarkable immunity against inoculation; but they have had more effect on the pig, which is more predisposed to pseudo-membraneous affections. When the virus taken from a fowl was inoculated upon another fowl, the result was fatal. M. Faiès, a pupil of M. Trasbot, even went so far as to try the experiment on himself, by keeping in his throat for several minutes shreds of a diphtheritic membrane taken from a cock, and he has remained quite well. It seems, therefore, as if M. Nicati's hypothesis were erroneous.

EPIZOOTIC DISEASE AMONG WILD ELEPHANTS IN INDIA.—There is an epidemic disease, corresponding to murrain in cattle (Cattle Plague), from which wild and tame elephants suffer at long intervals. It attacked the elephants in the Government stud at Dacca, in Bengal, about thirty years ago, and carried off nearly fifty per cent. of a total of upwards of three hundred. It lasted, with varying virulence, for more than ten years. The animals in best condition suffered most; only two, both in poor condition, are recorded as having recovered after seizure. The symptoms were: breakings-out and gatherings on the throat and legs, spots on the tongue, and running from the eyes. With the cessation of the flow from the eyes the animals died, usually on the second day after attack. In 1862, a similar epidemic carried off large numbers of elephants in the Chittagong forests. A few years later the herds in the Kákankoté jungles in Mysore were attacked; but the mortality was not great, and the disease soon left. On this occasion the fact of the elephants dying was well known to the Kurrabas.—*Thirteen Years among the Wild Beasts of India.*

TRICHINOSIS IN FRANCE AND ITALY.—We learn from the *Gazette des Hôpitaux* that Dr. Jollinet, a physician of the department of the Seine et Oise, has met with a number of cases of Trichinosis. Many persons suffered from serious symptoms after eating pork from the same animal. Out of twenty who partook of this food, sixteen were attacked. A portion of the pork was examined microscopically by M. Laboulbène, who had been consulted by Dr. Jollinet, and a number of *trichinæ* were found in it. The pork itself did not present any unusual appearance, not even when examined by a lens. This is the first epidemic of Trichinosis which has been observed in France. Trichinosis appeared for the first time in Italy, at Brescia and Piacenza, in April last.

TRICHINÆ IN AMERICAN HAMS.—According to the *Annales de Méd. Vétérinaire* of Brussels for August, M. Dele, of Antwerp, has been examining hams, bacon, and other products of pigs imported from America, and of 277 pieces he found one ham infested with trichinæ.

Correspondence, etc.

THE ROYAL VETERINARY COLLEGE AND "HONEST COMPETITION."

To the Editor of the VETERINARY JOURNAL.

SIR,—The subject of the Royal Veterinary College and its honest (!) competition with metropolitan practitioners, its own students, has been pretty well and fully discussed in your columns—editorially and otherwise; and the discreditable character of the school competition has been abundantly and conclusively demonstrated. Into this I will not now venture to intrude, but with your permission will direct the attention of the profession to a new move which, in my opinion, and that of others, is equally, if not more discreditable, as it would almost look like an attempt at deception. The agitation against the unfair competition of the College was commenced many months ago, and not long after the school authorities discovered that it was real—indeed, quite recently—a notice was issued by them that "advice gratis" to poor people would be given at Camden Town, medicines only to be paid for. This was with the ostensible object of obtaining that *quantum* of practical knowledge for the students which they never received before, but in reality to throw dust in the eyes of the public, and to try to cover the unpopular subscription competition—which it could not defend on any pretext—by making believe that the agitation was got up against the "advice gratis" system. That I am right in this surmise is proved by the last Annual Report of the College, just issued under the sanction of the Governors, and signed by C. N. Newdegate, who is, I believe, an honourable gentleman and an M.P. In that report, allusion is made to the new farce of sending students to the Deptford and Metropolitan Cattle Markets in search of diseased animals, and then there comes the following, to which I would particularly direct the attention of those who care to watch the course of events in that quarter: "Perhaps the most important feature in this department to which the Governors have to allude is the establishment of a 'Cheap Practice,' which is carried on by the senior students under the supervision of one of the Hospital Professors. The object of the Governors in instituting this system has been solely to afford the students an opportunity of treating patients for various diseases which before was unattainable by them. As will be seen from the Principal's Quarterly Report, a meeting of the profession has been called by circular, which sets forth that 'the system of competition maintained at the Royal Veterinary College, whilst degrading to the profession generally, is very unjust to individual members.' As the Governors' object, however, in this matter is so entirely clear, and as the owners of animals who apply for gratuitous advice and treatment are such as would rarely employ a veterinary surgeon, the Governors feel that no hardship is being done to the profession by the institution of this 'Cheap Practice,' and that it is quite unnecessary for them to take any further notice of the circulars which have been issued."

Now it must be confessed that a more barefaced attempt to mislead was never perpetrated, and we cannot believe that any honourable body of gentlemen could be guilty of knowingly lending themselves to such a deception. The Principal of the school knows full well that the profession justly complains—has complained for very many years—of the subscription system, and that the "Cheap Practice" subterfuge was only devised to conceal the degrading system, or rather to draw away attention from it, long after the present agitation was begun. The metropolitan veterinary surgeons do not object to the Cheap Practice among the animals of poor

people, but they do protest, and will protest yet more energetically, against the system of disgracefully cheap practice among animals belonging to a body of subscribers, not one of whom comes under the designation of poor, but the majority of whom are among the wealthiest in the land. But for the present agitation, "Cheap Practice" for the poor would never have been heard of; and but for the degradingly cheap practice for the rich the school must long ago have succumbed, as it has not produced—and never will produce—a teacher or a teaching staff capable of maintaining a school on its own merits. A school founded on such a system could not exist, would not be allowed to exist, for an hour were it a medical school. It is merely a great co-operative veterinary establishment, where wealthy subscribers, for an annual payment of two guineas, can have about as many hundred pounds' worth of service from practitioners who have themselves assumed the imposing title of "Professor." Of the intrinsic value of these services I say nothing, but from the price set upon it, it is evident the "Professors" do not estimate themselves very highly as men of science.

The report rather contradicts itself, for in another part we read that there has been an annual average increase of seventy-nine in the number of subscribers, and then comes the following: "The Governors are of opinion that, were the advantages and privileges of subscribers more widely known, the number would be very considerably increased, and with this view they have sanctioned the publication of an abstract of the proceedings of their meetings, by which means the College will be brought more prominently before the notice of the public."

Here we have an intimation of further touting—not for poor people to have their animals treated cheaply (we shall hear but little of them), but for rich subscribers to come forward and get advice and doctoring, such as it is, for next to nothing.

I confess to a feeling of sorrow at seeing Mr. Newdegate's name to such a report; I am sure he would be the last man in the country to countenance deception, or to allow himself to be made the victim of a piece of gross chicanery. The device apparent in this report reminds one of the "dodging" that went on when the Governors of the school were induced to apply for a charter of incorporation, which was doubtless intended to place the profession in the hands and at the mercy of the Principal. This species of chicane is certain to be found out. It was in the case of the charter, and it is again in this "Cheap Practice" *ruse*. I would suggest that a circular, pointing out this misrepresentation, and the real grievances of the profession against the Camden Town establishment, be drawn up at the next meeting of the London veterinary surgeons, and freely circulated, one being sent to every Governor and subscriber. Full exposure would soon bring about a change; the public like fair play, not underhand, hole-and-corner dealing, or mean subterfuge. I am, Sir, yours obediently,

August 14th. "A LONDON PRACTITIONER."

MEETING OF LONDON VETERINARY SURGEONS.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—Will you kindly afford me space in your pages to inform thos members of the profession who are interested in the matter, that the nex meeting of veterinary surgeons regarding the competitive fees of the Roya Veterinary College will be held early in October, at "Freemason's Tavern," and that due notice will be given of the day and hour.

I take this opportunity of correcting an error in the report of the last meeting of the council of the R.C.V.S. published in the current number of the

VETERINARY JOURNAL. I am described as "Hon. Sec., *pro tem.*, of a local society;" so far, no "local society" has been formed. I sought permission (by request, and on behalf of a large number of veterinary surgeons) to use the council chamber for *one* meeting—not "meetings." As a future guide, it would be interesting to know on what grounds the application was refused; and why, immediately afterwards, a meeting was allowed on a matter extraneous to college business. I am, Sir, yours, etc.,

August 16th, 1879. THOMAS MOORE.

A FEW REMARKS UPON THE NEW ARMY WARRANT.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—I am very pleased to see that it is under consideration to amend the Warrant for the veterinary department of the army, of May, 1878, and I hope the reply given in the House of Commons may actually mean something, and not be the usual evasive one for the purpose of gaining time. It is certainly not encouraging for junior members, who joined before 1878, to be told they cannot obtain first class until they have served twelve years—a most decided retrograde movement,—whereas those joining after the promulgation of the Warrant enjoy the same privileges regarding promotion, besides drawing a much more handsome salary for ten years. I often wonder if those now joining our ranks consider how *they* shall be treated should another Warrant be necessary at some future time, or how they would like to see a bait worth jumping at held out to young men joining, while they reaped but little benefit; but such has actually been done by the late Warrant. Those already caught benefit little—in some instances extremely little—while young members in civil life are tempted by the good pay offered for their services from the first day. I should like to ask what their prospects are if turned adrift—as all except four in each year must be—after ten years' army life, with £800 in their pockets, and more or less incapacitated for practice in civil life?

Perhaps it does not even occur to them that they are extremely liable to be sent to India, where the new Warrant is so far a dead letter, and where their pay is just the same now that it was fourteen years ago; and where, upon completing five years' service, they shall be treated to the handsome increase of rupees eighteen (18) per mensem. I should say that a goodly number of those gentlemen will be wanted out here, and if they remain five or six years in the country, will not enjoy the good things offered by the Warrant long before Government shall be in a position to dispense with their services, unless they belong to the lucky few selected to remain.

Some may say that Indian pay, rupees 377 per mensem, is not bad for young gentlemen on joining. This I don't dispute; but if it was only good enough fourteen years ago, what should it be called now, especially as the home pay is ever so much increased for the same class of officer? Then the miserable increase after five years service—about the equivalent of one shilling per day—is too distressing to think of.

As to the opinions entertained with regard to the new Warrant, I have sounded both senior and junior men, and all brand it as most unsatisfactory, and very different to what they expected. Now, if the former are dissatisfied, much more should the latter, who profit extremely little by it for at least ten years. Speaking of Indian pay, I may as well mention, for the information of those who know no better, that over and above the above-mentioned sum there is no allowance of any sort or kind—every expense or luxury has to be paid for out of that sum, and in many stations there is a very poor chance

of a young officer doing more than make both ends meet. As far as I can see, most items of expense are increased, especially horse's food, which in some places costs more than eight times as much as it did a few years ago, unless one resorts to an inferior food-stuff. I can actually give an example of the above; and although every place is not so bad, yet from what I know of several others, I should put it down at three to four times what it was two and a half years ago. Climate and everything considered, I am convinced that it does not pay to serve in India if one is at all comfortably off at home. True, there are fortunate ones who get to good stations, and for these it is no doubt pleasant enough; but what are they among so many? Take an example of the unwillingness of senior officers to come to the country, from the list of volunteers for the Afghan campaign. Only *one* expressed a desire for active service; the other two, I am told, remonstrated, but to no purpose, so out they came. One died at Peshawur, before even crossing the frontier; the second became sick at Kohat, and was unable to proceed further; and the third, I believe, found himself told off to do duty with a battery of artillery on his arrival. Are such things encouraging? I say, Most decidedly not. I feel sure there are plenty of senior officers in the country who would have volunteered willingly had there been any extra pay attached to the appointments, and their places in batteries or regiments could have easily been filled by junior men from home; but the authorities not getting satisfactory results from volunteering, had to take the usual steps, and out came two officers, one, if not both, of whom had never been in the country before. Now I leave it to those who know something of India, and the character and language of the natives, to say how useful for executive work a person would be who is perfectly ignorant of all these items; also what endless trouble he would have at every turn, so long as he had anything to do with natives. Had there been a proper system of supervision adopted, under an efficient veterinary staff, the saving in baggage animals, and therefore in money, would have been enormous. As it was, these animals, the very backbone of the various columns, were always over-worked, under-fed, and consequently inefficient. I could add a great deal more, but shall content myself with this for the present. The few defects I have ventured to bring to light are principally intended to meet the eye of the young aspirant in civil life, who would willingly learn a little before he decides for or against the army.

I think if most young men knew as much before joining as they do in the first few years, the number of applicants would sensibly diminish. I know it is extremely difficult to obtain information of any sort or kind respecting the army in most country districts, and indeed at some of the colleges; therefore, with the hope of your finding space for my few remarks in your widely-circulated journal, I have been tempted to pen them.

I am, dear Sir, yours very faithfully,

India, *July 7th*, 1879. "R.H.A."

ANORMAL CONDITIONS OF THE TESTICLE.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—Seeing an account in the last issue of the VETERINARY JOURNAL of the communication of Mr. J. R. Dewar, containing a very interesting history of the finding a hair in a serous cyst within the testicle, I thought a few remarks respecting something similar might prove interesting to your readers.

A few years ago, while castrating a yearling colt, as soon as the incision was made for the purpose of operation, a tuft consisting of many hairs was found loose in the scrotum, and escaped with a quantity of serous fluid.

In this case there was nothing abnormal in the testicle, the hairs being quite free from any attachment.

Last year, whilst castrating a yearling colt, I noticed that one of the testicles was hard and enlarged, and on making an incision into it, I found two cysts. These contained what appeared to be cartilaginous tumours, one of the tumours being about the size of a large walnut, and one that of an ordinary nut. The tumours came out of the cysts quite easily, there being apparently no attachment between their walls, and they reminded me of the tumours found in the areolar tissue under the skin of horses.

I did not cut open the tumours but have preserved them intact, so am unable to say of what they are composed, but they are very hard to the touch.

I have also, within the last two years, found three specimens of the *Strongylus armatus* in the scrotum. Two were floating free, and the other had its head imbedded nearly half an inch into the structure of the testicle, which I think must be a very uncommon occurrence. These nematodes were fully 1¼ inches long.

Yours obediently,

Southminster, *August 14th.* WILLIAM A. HURRELL, M.R.C.V.S.

ADDITIONAL REMARKS ON A CASE OF VENTRAL HERNIA.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—Having seen a case of the above from the pen of Mr. Queripel, V.S., R.H.A., in your May number, I have pleasure in adding that the horse came under my care, when the hernia was about 3½ inches in diameter. The battery to which it belonged was then on the march, and no steps could be taken so long as the patient was kept moving. However, so soon as our station was reached, I applied biniodide of mercury ointment with very good results, the swelling becoming slowly but gradually smaller, until at last it seemed to come to a standstill. It was not considered advisable to work the patient, therefore it was recommended for casting; but being a young, good-looking animal, the committee, upon the advice of the principal veterinary surgeon, recommended a trial at work. This recommendation was acted upon, and strange to say, the hernia gradually diminished until now scarcely a trace of it remains. The situation was immediately in front of the stifle joint, against the anterior aspect of which rested the posterior part of the hernial pouch or bag. It is now nearly two years since I first saw the horse, and he has never been in the least incommoded by this abnormal state of affairs. I dreaded his return to work, and was agreeably surprised to find he was equal to the task without giving me further trouble.

Now, I think such an occurrence is always worthy of being recorded, for it is seldom one would care to take such a formidable-looking case, as it must have been at first, in hand with any hope of a cure; besides, in my opinion, the situation for such a thing could not well have been worse.

I am, dear Sir, yours faithfully,

S. GILLESPIE, V.S., R.H.A.

Camp Shalofzan, Kurrum Valley, 8*th July*, 1879.

P.S.—The hernia could always be reduced with the greatest ease.—S. G.

COMMENTS.

In *The Field* for July 26th, Mr. S. L. Ragg, M.R.C.V.S., publishes a case of Tetanus in which recovery took place, and in which nitrite of amyl was administered. In his letter he states that, so far as he is aware, "no case has been recorded in which lock-jaw has been treated with the nitrite of amyl." A reference to the VETERINARY JOURNAL for June, 1877, will show that Mr. A. Lawson, Manchester, had in February of that year employed this drug successfully in the treatment of Tetanus.

It is satisfactory to note that the Veterinary Department of the Privy Council has corrected the mistake it made in designating Swine Plague "Typhoid," and in a recent order now alludes to it as "Swine Fever." Swine, however, are liable to various fevers, and we are not sure to which of these the order may be applied by inspectors and others. The amendment, nevertheless, must be accepted as a small concession to the requirements of comparative pathology. Meantime, we observe that what the newspapers record as an extraordinary event has occurred in Somersetshire, and which, they assert, "will render an alteration of Privy Council Cattle Disease Orders necessary." This event is the demise, in Somersetshire, of a number of pigs from Pleuro-pneumonia. "As this," they state, "is a disease hitherto unknown in pigs, the Orders in Council make no provisions in reference thereto, and the Department has been written to for instructions, the magistrates possessing no power to order the slaughter of the infected animals." In addition to "Typhoid," "Swine Fever," and the other inappropriate names given to this porcine plague, it appears that it is now cropping into notice as "Pleuro-pneumonia"—a mysterious pig disease! Inspectors should be required to have some knowledge of the pathological anatomy of this grave disorder. As time goes on and the disease extends, we shall learn from experience some of the more obscure characteristics of the scourge, and especially with regard to its contagious properties. In the neighbourhood of Cirencester a serious outbreak occurred a short time ago, at the farm of a Mr. Smith, Chesterton. All Mr. Smith's pigs were bred by himself upon the farm, and therefore there was not the least suspicion of the disease having been communicated from any outward source. The only cause that could be assigned for the outbreak was the following:—About four years ago some of Mr. Smith's pigs were affected with "Typhoid" in the same sty, when the whole of them were slaughtered or died. No measures for disinfecting the sty were then taken, but it remained unoccupied by pigs up to the time of the last outbreak, with one exception, and then it was only tenanted for a short time, and there was a large supply of straw in the sty. The pigs lately affected had no rings in the nose, and having rooted up the floor of the sty considerably, it was thought probable that they may have come in contact with some of the germs of contagion remaining from the former outbreak. Dr. Detmers, who has been studying the Swine Plague by order of the United States Government, says he has abundant proof that the disease is only propagated by contagion; that a hog that has been affected can communicate the disorder, under favourable circumstances, two months after it has apparently recovered; and is inclined to the opinion that no pig can ever again be entirely healthy after having once been diseased.

In the VETERINARY JOURNAL for December, 1878, Mr. Olver, Tamworth, published an interesting case of Hysteria in a thoroughbred pregnant mare. We are now informed that the mare has produced a fine, healthy foal, and that she had not suffered from any subsequent attacks of Hysteria.

In the "Transactions of the Highland and Agricultural Society of Scotland," just published, there is a somewhat detailed historical account of the veterinary department of the Society, which must prove interesting to those who care to study the progress of veterinary medicine in this country. The collapse of the

certificate system is accepted as an unwelcome fact; and it is acknowledged that, "under the circumstances, the Society considered it impossible to continue to grant certificates." It was scarcely to be supposed that matters as they now are could be fairly represented by an intensely patriotic Society, which had striven so hard to split the profession into two inefficient and unfriendly competing sections; and it might have been expected that the long-standing misrepresentation which has been so often offered as a reason for its action would again be brought forward. The expectation is not doomed to disappointment, for in concluding the fully detailed "account," the writer remarks:—"It only remains to be observed that, by the decision of the Privy Council, the monopoly of granting veterinary diplomas for all parts of the United Kingdom remains in the hands of the Royal College of Veterinary Surgeons; and that the colleges in Scotland, which have been so productive of good in the past, must henceforth be under the authority of an *English Council*." The *perfervidum Scotorum* could scarcely have carried the writer further in the matter of misrepresentation; for he surely must have been fully cognisant of the fact that the Council of the Royal College is no more an *English* Council than that St. Stephen's contains only an English Parliament. When the representative body of the profession is only an *English* Council, then there can be no doubt that a veterinary charter will be speedily obtained for Scotland.

CORRECTIONS.

The following corrections are requested to be made in Mr. T Hopkin's paper on "Antisepticity":—At p. 38, line 27, for "true" insert "new"; p. 39, line 12, for "clime" insert "clinic"; line 26, for "wine" insert "urine"; p. 40, line 5, for "wine" insert "urine"; line 32, for "nay" insert "hay"; line 34, for "injection" insert "infection"; line 42, after "He says" add "objects"; p. 41, line 28, for "chemical" insert "clinical."

At page 79, line 18, for "epididymus" insert "epididymis."

We regret that pressure on our space compels us to hold over communications from Messrs. F. F. Collins, Nunn, Butters, Miles, F. Smith, Hedley, and others. These will appear in our next issue.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from F. Smith, Royal Artillery, Woolwich; G. A. Banham, Brown Institution, London; F. Duck, Royal Artillery, Zululand; P. R. Gordon, Brisbane, Queensland; M. Hedley, Dublin; A. H. Santy, Norwich; Professor Walley, Edinburgh; S. Locke, Manchester; "Ignoramus"; F. Miles, Mallow, Ireland; F. F. Collins, Simla, India; W. D. Sartin, Royal Artillery, Woolwich; L. Butters, Norwich; J. A. Nunn, Royal Artillery, Punjab; W. Broughton, Leeds; T. Moore, London; S. Gillespie, Royal Artillery, Kurrum Valley, India; W. A. Hurrell, Southminster; "A London Practitioner."

BOOKS AND PAMPHLETS: *A. Wynter Blyth*, The Composition of Cows' Milk in Health and Disease; *C. J. Eberth*, Die Fötale Rachitis; *F. V. Birch-Hirschfield*, Lehrbuch der Pathologischen Anatomie.

JOURNALS: *Index Medicus; Wochenschrift für Thierhielkunde; National Live Stock Journal; Archives Vétérinaire; Annales de Méd. Vétérinaire; Farmer; Mark Lane Express; Agricultural Gazette; Archiv für Wissenschaft und Practishe Thierheilkunde; Australasian Chemist and Druggist; Lancet; Medical Press; Recueil de Méd. Vétérinaire; L'Echo Vétérinaire; Social Notes; Revue Vétérinaire; American Veterinary Review; Turf, Field, and Farm; Journal of Anatomy and Physiology; Quarterly Journal of Microscopical Science.*

NEWSPAPERS: *Hereford Journal; Scotsman; North British Mail; Melbourne Leader; Australian Sketcher; Dundalk Herald; Freeman's Journal; Galloway Gazette; Albany Cultivator and Country Gentleman; New York Herald.*